

# AUTOMOTIVE INDUSTRIES

## The AUTOMOBILE

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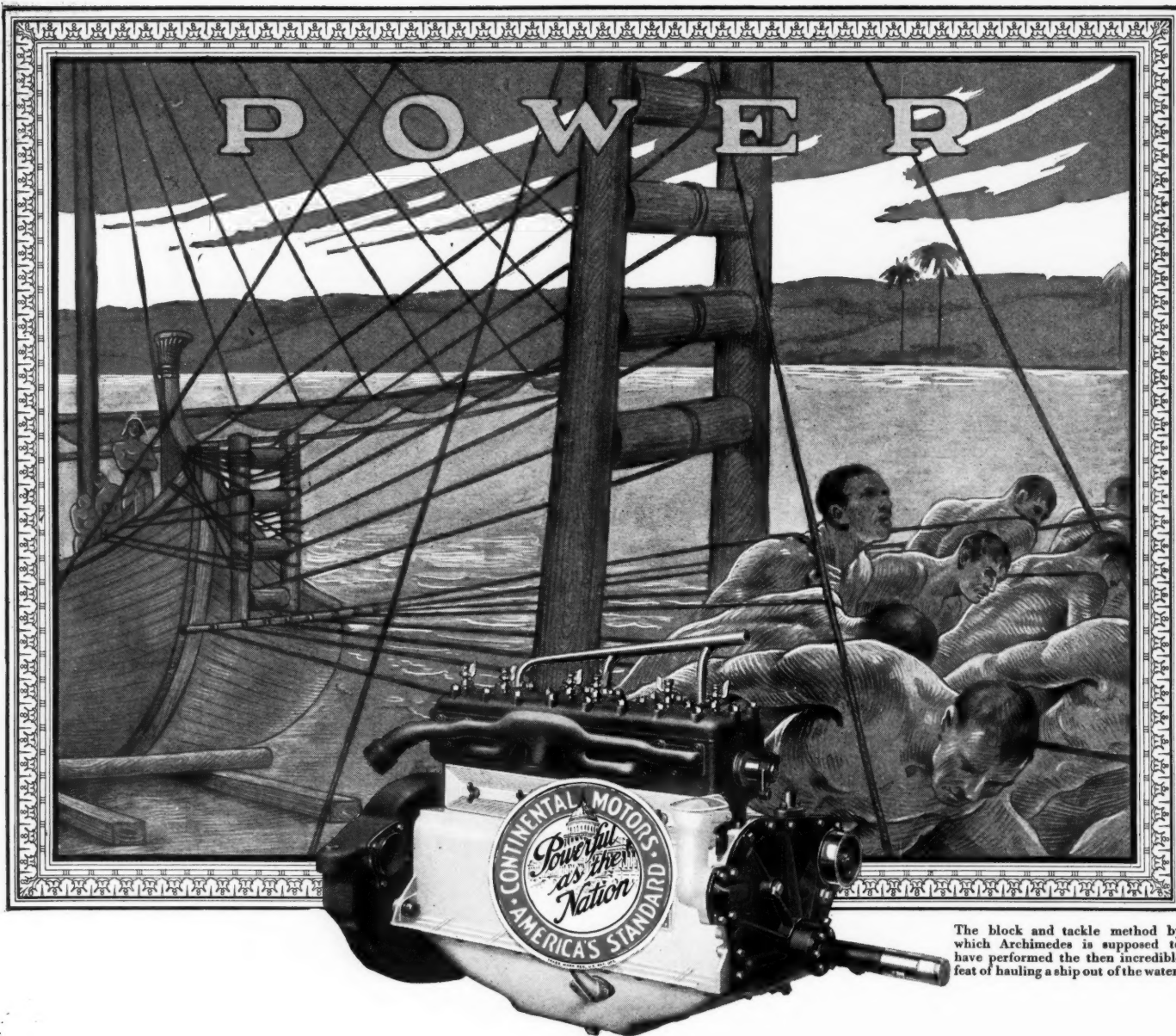
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**CONTINENTAL MOTORS CORPORATION**

Offices: Detroit, U. S. A.

Factories: Detroit and Muskegon

# ***Continental Motors***

Largest Exclusive Motor Manufacturers in the World

# AUTOMOTIVE INDUSTRIES

## *The* AUTOMOBILE

VOL. XLIII

NEW YORK—THURSDAY, DECEMBER 9, 1920

No. 24

## There Is an Automotive Future; Speak Well of It

The automotive industry, generally speaking, is a well-designed, well-equipped machine. It has just been in the garage for an overhauling. Some bugs have been eliminated and we are ready to start on a long-distance race. Now, rooters, all ready!

By Clyde Jennings

**D**ESPITE all you may hear to the contrary, the automotive industry has a future. It will be a bigger and better future and will develop more quickly if we all speak well of it.

Victor Hugo said regarding his good old Bishop, "His past life would have made no difference, but that there were so many tongues to talk and so few heads to think."

Such a situation often arises, in business as well as socially. There never was a better time than the present for the automotive industry to stop, look and listen and define its program for the future, then talk about that program and let the past be buried. Of course there are a lot of good deeds that deserve to live, and they will live without our talking about them for the next few weeks. There are things much more important to talk about.

The other day a student of the automotive industry paraphrased J. P. Morgan's famous remark, "The man who is a pessimist on the future of the United States goes broke," in this way:

**"The man who is a pessimist on the future of the automotive industry will go broke if he deals with it financially."**

We think you get the idea.

The head of one of the largest manufacturing plants in our industry remarked a few days ago:

"We are looking only to the future. A few weeks ago we looked the situation fairly in the face and decided what was going to happen to affect us adversely. All of the things that we looked forward to are happening. We have seen nothing discouraging in itself since then. Some of the favorable things we expected to happen have not happened as yet. But they are coming, only more slowly than we hoped. We expected to see some revivals start. They are starting, but not with the force that we expected. We underestimated the time necessary for the housecleaning in some other industries, but these are being ironed out and very soon we shall all be able to start uphill together."

Now let us look over the field for a moment.

Recent developments have confirmed the belief previously held that the financial interests of the country are entirely and well sold on the possibilities of the automotive industry. These interests are working with all of their power to conserve the useful productive capacity of the country. We already have

evidence that no efficient, useful, productive plant will be allowed to pass into ruins. In our industry failures have been few. With the dawning of the revival appearing, there are going to be fewer failures. New capital is coming into the industry and new men of the caliber required are coming with this capital. Next year will see the industry better financed than ever before.

Parts makers have recently told us that they are receiving good contracts for next year. Price difficulties that existed between the car maker and the parts maker are being ironed out and the principal factories (if we may quote an important equipment maker) are placing definite orders. The scare of cancellations is passing. Most parties to these cancellations realize that it was bad business practice, a development of the war time period when a cancellation made no difference to any one, because anything could be sold for something and everybody was too busy making money to count up the losses.

This cancellation business has been a serious lesson, however, but let's bury it with the rest of the bad business and resolve never to do it again.

During the present period the export trade has been appreciated as never before. It has been a life saver for some factories and is supplying a reason for opening some of the factories that have been down. We hope this lesson will never be forgotten and that next June, if sales crowd production, the manufacturer will not forget what he learned this fall.

But we started to talk about the future.

The show season will come just after Christmas. First, the two manufacturers' shows and then the host of dealer shows. All of these are going to be of the very utmost importance. It is of record that in the two national shows that the requests for dealer tickets are much greater than ever before. This means that the manufacturers are making a greater effort than ever before to meet the sales situation. They are going to bring in their dealers and talk with them. That is a hopeful sign, if they will talk of the future and not of the past.

We might as well be frank. If either the manufacturers or the dealers start talking of the past, the mudslinging will not stop soon enough for the future program to start. Neither selling organization has been without fault and the story is a very long one.

But why not get down to the future right when the meeting opens and be sure that all present understand what "salesmanship" means, and then tell how they are going to get busy.

As a matter of fact, both dealers' and manufacturers' sales departments are, by and large, good fellows and they are earnest in their work. Both have the same object in view and there is no reason why they should not work together. They MUST work together, if they will succeed.

The manufacturers must realize that the men in the display spaces at the shows must not be selected because they happen to have evening suits and look well in them. They must be selected because they can take advantage

of every opportunity to talk intelligently and directly on all points regarding the car exhibited, obtain the name of the prospect and know what to do with it.

The coming show season is not one in which any person interested in the automotive business can afford to let any prospect slip. He will need them all.

Now we hope no manufacturer is fooling himself with the idea that he is going to book enough orders at the show to run his factory all of 1921 at the rate he planned to run in 1920. But we hope that every manufacturer will go to the show with his ideas set to see some material indications of relief from the present buying situation and with a just appreciation that an awakening cannot and will not come all at once.

We are passing through a period of careful buying. This feeling will not pass entirely for a long time. It will be relieved. The most potent force in relieving this situation will be for the commodities that go to make up the general cost of living to reach what to the average mind is a fair level.

Until the average mind is more or less settled on this cost of living item, the chauffeur of the average mind is going to be a very hard man to sell to. While he is in a fighting mood with the grocer, baker, clothing merchant and with all of those lines of business with which he comes into daily contact, he is not going to spend money freely elsewhere.

The recent sales slump was more of a psychological problem than a financial one. Its cure must take this into consideration. Practically every one who has a purse to-day is watching it very closely. He believes that whoever comes near him has designs on the purse and he believes that every one except himself is profiting by the present circumstances. He is defiant to any effort to persuade him to

buy anything. It is a fact that some very wonderful bargains in food and clothing are going begging to-day.

When the manufacturer and the dealer meet it will not be a case of either saying to the other:

"It's your job."

They will have to say:

"It's our job, and so big a one that we all must work at it."

Let us suppose that these things work out this way. The exhibits are properly handled at the shows, some sales are made and the proper use made of the information gathered, then what?

Well, spring is coming, and just as surely as the young man's mind turns to love, so does the mind of the average individual turn to better and more cheerful things. The season for automobiles will be before him, the profiteer story in the newspapers will have been succeeded by the story of the attempted economies of the G. O. P. Administration in Washington. The entire environs of the individual will be changed.

So will be the environs of the sales departments. Both the prospect and the salesman will have learned much while the snow was with us. Everybody will be refreshed. These conditions should make for business.

Of course, the lessons of adversity never last long, especially to youth. It is not literally true that the burnt child shuns the fire, but we hope that this big, youthful industry of ours will remember the lesson long enough not to believe that a few swallows make a summer and that because they sell a few cars next spring the pace will grow to that of early 1920. There is a season of hard work before all of us.

We are optimistic, to be sure. We are enthusiastic, to be sure. We hope all of you are.

But don't let optimism and enthusiasm run away with you.

The automotive industry is not coming back, because it has never been away. It only slowed down a bit. It has been here all of the time.

**It is already speeding up. But we are not expecting that anyone will jump into high at once. It is upgrade and speed must be gathered slowly. The truck, as is natural, got going a bit slower than the passenger car, and as it never quite gains the speed of the passenger car, it is going to gather speed more slowly. But the day is coming when its weight and accumulated speed will put it out in front.**

Remember that the truck is not a speed marvel. It is not like the passenger car in sales. Impulse has little to do with buying a truck. The automobile should sell on the upward surge of the improved conditions, but the truck will have to wait until industry is adjusted to the improved conditions before it gets to going well.

And just here let us put in a word about truck selling. **The entire system, from the factory down, is due for a readjustment and it must have it.** Just as surely as business gains impulse, the truck business will follow if the truck salesmen are competent to present the truck to business men who need transportation.

The day of long credits and foolish truck sales are past.

We said we were not going to talk of the past. But we want to refer to a bit of the past that is going to be a brilliant part of the future.

You all know that there are several truck and passenger car factories that are going forward at a rapid rate and their production has been cut but a very little bit.

It happens that the writer knows something of the sales history of these companies. He believes that they are of the highest type that exist in this or any other industry.

1. They are founded on equitable distribution.
2. A sales territory that insures the dealer a living with the amount of merchandise that can be given to him.
3. On prompt service and shipment of parts.
4. On fair dealing to every man.
5. A proper system of follow ups.
6. On useful helps from the home office for every man who is connected with the sales department.

All of these firms, so far as we have been able to learn, have taken on their foreign business on exactly these terms. No chance sales and shipments were ever completed.

**The idea behind the sales is that every car or truck sold shall stay sold, if it is in the power of the dealer or the factory to keep it sold.**

We hope you let the last statement sink in. It does not say that all factories that have been down in part or total had defective sales systems, but it does say that all factories that did not show any great degree of slowing up had efficient sales departments.

**Think it over. Perhaps you can find some place in the sales or service departments where there was a cotter pin missing, some lost motion or a worn out gear.**

Just one word more. It has been asked what could be done with the new capacity for production.

One answer is to make parts for the vehicles already sold. There is a lot of money in parts. It is quite as profitable to keep some cars running as it is to sell a new one to replace it. When business gets going and cars begin running, there is going to be a big demand for service. Be sure that you are ready to meet these demands.

Did it ever occur to you that the talking machine folks are less interested in the sale of the machine than in the sale of records that it leads to!

## Tractor Production in the United States

**I**N an investigation made by the Bureau of Public Roads, United States Department of Agriculture, of the production of tractors in the United States during 1919, reports from 80 manufacturers show that they manufactured a total of 164,590 tractors during the year. The number actually manufactured during the year was only a little over one-half of the total production estimated in reports made to the Office of Farm Equipment Control, United States Department of Agriculture, in January and February, 1919. Labor troubles and shortage of material, together with the fact that some of the companies discontinued the building of tractors, accounts in part for the decrease in production below the estimate.

The reports also gave the number sold in the United States and for export, and the number on hand, in transit, in branch houses, and in the hands of dealers unsold on December 31, 1919. Five of these manufacturers built only tractors of six belt horsepower and less. In all, reports were received from 156 companies but only 80 had manufactured machines during the year. It is believed that the total number of machines manufactured by these 80 firms represents at least 95 per cent of the total tractor production in the country during the

year. The number of tractors of different sizes built by these companies during the year 1919 is as follows:

Makers' Rating Belt Horsepower	Number of Tractors Built
6 and less.....	3,760
9, 10 and 12.....	1,991
16 and 18.....	22,012
20 and 22.....	94,653
24, 25 and 26.....	15,546
27, 28, 30 and 32.....	17,597
35 and 36.....	2,453
40, 45 and 50.....	1,954
60 and over.....	1,624
Not given.....	3,000
	<hr/> 164,590

The following is a summary of the reports received from the manufacturers for 1916 to 1919 inclusive:

	1916	1917	1918	1919
Number manufactured ....	29,670	62,742	132,697	164,590
Number sold in the U. S..	27,819	49,504	96,470	136,162
Number sold for export...	....	14,854	36,351	19,693
Number on hand Dec. 31..	....	15,525	15,401	27,740

# British Truck Show Reveals New Tendencies in Design

At the first exhibition since 1913 decided changes in practice are noted. A majority of the trucks use the overhead worm drive and pressed steel frames are employed in three-fourths of the models. T-head engine being replaced by L-head type. Trade dull and slight interest shown.

By M. W. Bourdon

THE falling off in the volume of sales of commercial vehicles, which commenced two or three months ago in Great Britain, may have been checked to some extent by the exhibition at Olympia (London), Oct. 14 to 23, but the show has not brought any rush of orders to makers of vehicles of load capacities from 2 (long) tons upward. It was sparsely attended by prospective buyers in general and those of certain types of vehicles in particular, though it was hardly expected that the condition of affairs brought about by the sale of large numbers of surplus Government trucks would be varied appreciably by the exhibition.

These surplus Government trucks, mainly of 3 to 4½ tons load capacity, are being taken in hand by responsible firms—in some cases by their original makers—and after renovation, amounting almost to rebuilding, are being sold, or perhaps one should say offered for sale, at prices approximately half those of new vehicles of similar type. No wonder, then, that orders for trucks of this type have been comparatively few at Olympia. But quite a number of makers of 1 to 1½ ton trucks tell a different tale and report a very distinct improvement in respect of orders and inquiries.

The "heavies," represented by types carrying from 5 to 10 ton loads, and ranging from gasoline engine trucks of the former capacity to steam and gasoline vehicles and trailers, are not under such a cloud as the classes immediately below them in size. But hitherto the 3 tonner has been the mainstay of the British truck industry, so that the scarcity of prospective buyers interested in new machines of this type most seriously affects the industry.

The charabancs (sightseeing type of bus) and omnibus orders have saved the situation to a certain extent, for, as a rule, a chassis similar to that of the 3 ton truck is used outside London for passenger services. Bodies for passenger services are very numerous at this show, not one maker of chassis in any way suitable failing to exhibit one or more examples. But here again, there has been a slackening in the demand relative to output.

It is of interest to note that there are only six British chassis designed for industrial purposes to carry loads under 4500 lbs. There is no one competing with the Ford truck, or supplying a modified touring car chassis for a similar purpose.

## Engineering Features

From the engineering standpoint, the show has peculiar interest, if only because it brings to light, collectively, the developments which have matured since 1913, for no truck show has been held in London since that year. To cite a few of the new tendencies, there is first and foremost the popularity of the overhead worm drive, which is used on

52 per cent of the models, against 20 per cent for the double reduction, 23 per cent for chains and 5 per cent for bevel gear. The internal gear drive does not appear at Olympia on any British truck. Then there are the wider uses of pressed steel (77 per cent) in lieu of rolled steel frames; the retention of pair cast cylinders in the vast majority (77 per cent) of engines over 20 hp., but with "L" heads (84 per cent) instead of "T" heads; the increased area of wearing surfaces in such items as steering joints, spring shackles, brake shoes and drums, and brake connections.

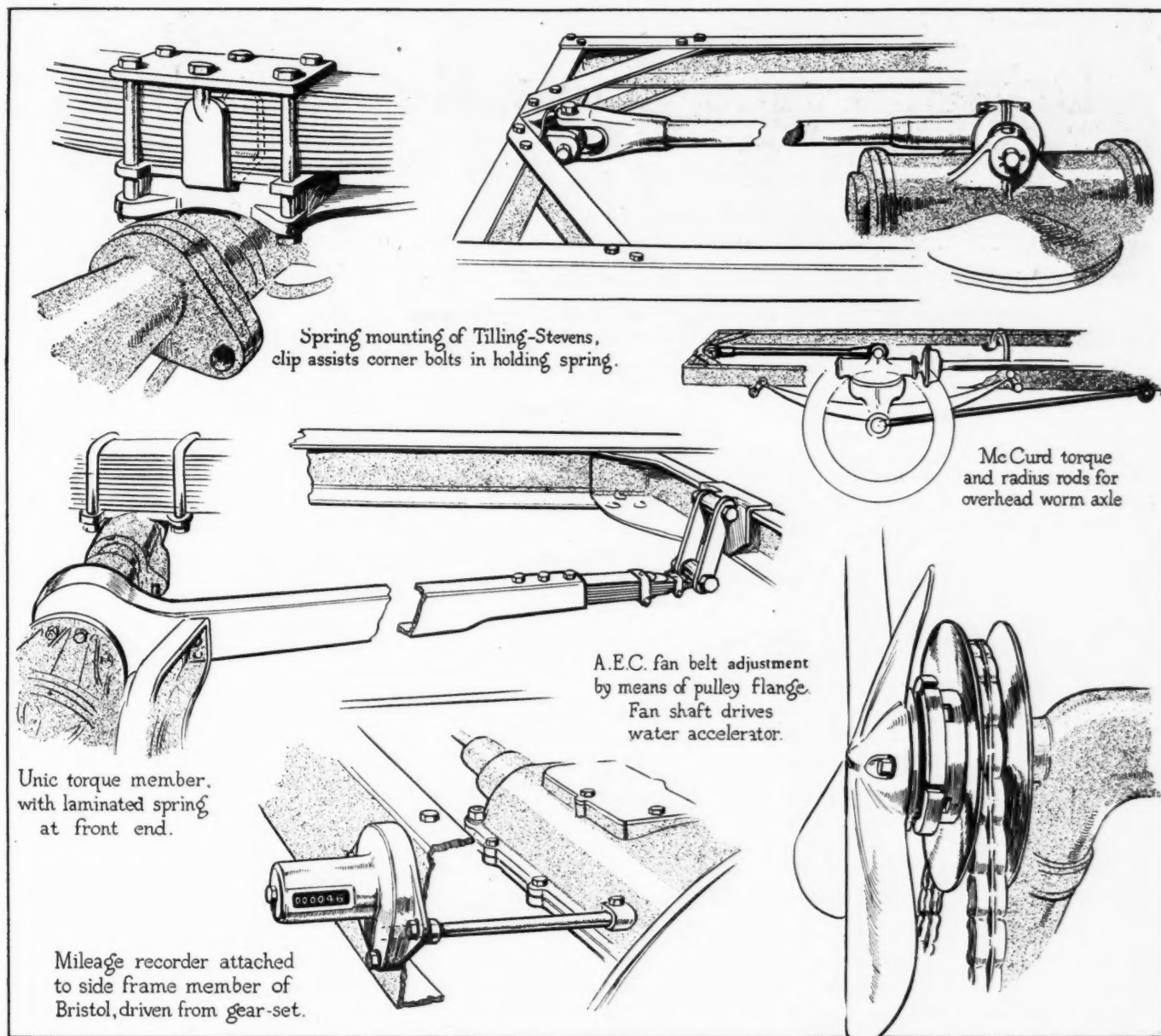
## Driver's Seat Location

There are other examples of tendencies which are barely observable now, but which are very likely to prevail eventually. Of these may be mentioned the moving of the driver farther forward—alongside and higher than the engine—as in the new K type London bus chassis. This arrangement obviously lengthens the platform area without increasing the wheelbase, but, to be carried out properly and to its logical conclusion, it calls for a re-designing of the engine, in the way of grouping all the units requiring attention—magneto, oil and water pumps, oil filler and level gage, etc.—on the opposite side of the cylinders or crankcase from the driver, the steering column and pedals.

The new Straker-Squire (3 to 5 ton chassis), and the new Maudslay 6 tonner are examples of this tendency, though they vary in their method of adopting it. The Straker-Squire goes only half way—there is still a short hood in front of the dash—whereas in the Maudslay the driver is right alongside the cylinders, and the latter are well below him, only the radiator projecting forward of the dashboard and "cab."

For the first time a British firm has cantilever springs on a chassis for 7500 lb. loads—the 3 to 4 ton Palladium. At present semi-elliptics are supplied with chassis for truck bodies, the cantilevers—which it should be said are in duplicate, one unit of a pair being above the other, though pivoting on the same trunnion—being reserved for charabancs and buses; but it is the intention to standardize the cantilevers in the immediate future. The makers claim that the suspension is so much improved that the effect of pneumatic tires is equalled; but in this respect it may be said that there is a general tendency to lengthen or otherwise improve the springing, and the K type bus supplementary "full load" springs of the spiral type are not now alone, Straker-Squire, Caledon and one or two others having systems on similar lines.

Before the war the rolled steel frame of channel section was very widely used in British trucks; no definite percentages are available, but it is estimated that at least 50



Details of trucks shown at Olympia

per cent of the medium capacity and heavy vehicles at the 1913 show had this type of frame, rolled steel cross members also being used. But, as mentioned above, 77 per cent now have pressed steel, the rolled type being used in 16 per cent and the flitch plate with ash filling in 7 per cent only (two Daimler models and one A.E.C., for example).

Several makers who in earlier days had rolled steel frames have continued their policy of arranging the open side of the channel outward now that they have taken to the pressed side members (Straker-Squire, for instance). The claim is that this presents manufacturing advantages, and that the user is not concerned with appearance; even if he were, the open channel is almost entirely hidden by the bodywork. The plan undoubtedly is of advantage in fitting cross members, engine bearers and brackets for the control pedals, and although the spring hangers and certain other details must then be fitted inside the channel instead of vice versa, the balance of manufacturing advantage is probably with the system, which is favored in approximately 10 per cent of British trucks.

As regards dimensions, 3 to 4 tonners usually have frame sides 2½ in. wide and 8 in. deep over the greater part of their length, but some are only 7 in. deep. The Dennis

new 2 tonner has 7 x 2½ in. side members, made, however, from 5/16 in. plate, while truck frames up to 4 tons are usually only ¼ in. thick.

Pressed steel, tubular and cast steel cross members are all used by one make or another; the new 4500 lb. load Commer, with pressed steel side members, has a cast steel cross member under the radiator and four of pressed steel behind it. The new Halley (4500 to 5550 lb. load) on the other hand has rolled steel side members with the channel outward; two cross members at the front, carrying the engine sub-frame, are cast steel; behind them are two tubular members, and aft are two of pressed steel, the latter being braced by diagonal struts of flat section steel.

Rolled frames are, of course, of the same depth from end to end, but there is only one maker attempting to stiffen such side members between the springs by fitting a truss at each side, the unassisted channel is generally depended upon.

If an exception is made of the Palladium with cantilevers as previously mentioned, half elliptic springs are used exclusively, 75 per cent of the rear springs are mounted above the axle, the remainder are underslung. Unit shackles, either cast steel or drop forged, are favored, with bearing



A. E. C. saloon bus on K type chassis seating 36 passengers



A. E. C. combined scuttle dash and half-hood

pins of much larger diameter than before the war. In a few cases the second spring leaf is continued to support the eye of the top leaf.

There is an entire lack of uniformity in number and thickness of leaves for 3 to 4 ton trucks. For the back of this type chassis one maker uses eight leaves 4 in. wide, six of them  $\frac{1}{2}$  in. thick, and another eleven leaves  $3\frac{1}{2}$  in. wide, with seven of them  $\frac{7}{16}$  in. thick, both sets having approximately the same centers, viz.: 54 in.

Complaint is rife concerning the quality of springs. Batches vary almost incredibly when the care taken in making up specifications of steel is considered. One designer was only stopped at the last moment from writing for samples to U. S. A., his directors objecting on patriotic grounds.

#### Engines, Cylinders and Valves

Only the 3 to  $3\frac{1}{2}$  ton Halley has 6 cylinders (cast in threes). All the others have four cylinders, and among these 77 per cent have pair-cast cylinders and 23 per cent block cast, none of the latter being in chassis of over 2 tons capacity. The tendency to discard T heads and adopt L heads is evidenced by the fact that 84 per cent have the latter, though Dennis, one of the oldest and best known makers, still favors the T head, and retains it in his new 2 tonner, as well as throughout the range of sizes. Thornycroft is the only other maker of note with the valves on both sides, but one model has overhead inlet and side exhaust.

Overhead valves, apart from the case just cited, are used by only three makers, one producing a small parcel carrier. Maudslay still continues the overhead camshaft, which with its bearing housings can be pivoted over to one side, clear of the valves, a universal joint being located near the top of the vertical drive shaft. This arrangement is used on all models, including the new 6 tonner, with pair-cast cylinders. The Scammell tractor (with two-wheeled trailer) has an overhead valve engine with push-rods, the only example of this arrangement. Daimler has the Knight valves, of course, while the Argyll type (Burt) single sleeve has been taken up for a new model by Caledon, an old established firm.

Detachable heads appear in only 20 per cent of engines, pair-cast and block, and where they are used the cylinders are invariably separate from the aluminum crankcase. The latter material, by the way, is normal for crankcases and for 50 per cent of gearsets.

The hollow shaft system of lubrication has made a lot of headway since 1913, when either the trough or the drip

and splash appeared in the vast majority of engines. Hollow shaft systems are used in 57 per cent of models, the remainder having modifications of the trough arrangement.

More attention is being paid to filtration of the oil, especially in making very accessible a large fine mesh gauze strainer. This is usually found in a chamber cast on the side of the crankcase, well above the oil level, and can be removed, cleaned and refitted without loss of lubricant in a minute or so. While the desirability of this has appealed to makers using hollow shaft lubrication, the trough system adherents in many cases still have the only filter in the sump, generally with the submerged oil pump in the center of a cylinder of gauze, the latter attached to and removable with a small under-plate.

The gear type oil-pump is by far the most widely used. Daimler uses the multiple plunger type with trough lubrication for the big ends, while the Albion has it for a variation of the hollow shaft arrangement.

Plunger circulation indicators for trough systems and gauges for the hollow shaft, both connected as usual to bypass pipes, are the rule; but in Commer trucks, which have the trough system, the whole of the pump delivery is taken to a sight feed on the dashboard, the oil passing in a stream within view of the driver between the front and back glasses of a short cylindrical and horizontal casing, whence it flows by gravity through a  $\frac{7}{8}$  in. bore pipe to the distributing ducts in the crankcase.

#### Cooling Systems and Radiators

Pump water circulation is used in 85 per cent of British trucks and thermo-syphon in only 12 per cent, the remainder being assisted thermo. In the latter a water accelerator placed in front of the cylinder jacket is driven by an extension of the belt driven fan shaft. The simple thermo-syphon appears on even 3, 4 and 5 ton models, and those, too, made by firms of standing and repute—Commer, for example. The new Bristol 3 to 4 tonner, made by the Bristol Tramways Company, who have had 14 years' experience as users of other makes, also has natural circulation. In some cases the pumps are belt driven, being not much different from the accelerators of assisted thermo-syphon systems. The pipes used in such cases are of smaller diameter than thermo pipes, but larger than those used for mechanically driven pumps, generally being of from  $1\frac{3}{8}$  to  $1\frac{3}{4}$  in. bore.

In only one case is the honeycomb radiator used, and that in a cab chassis sold also as a 10 cwt. van; the gilled-tube type with cast top and bottom tanks (nearly always

of aluminum) is almost universal, appearing on 96 per cent of the chassis. One maker, (W. & G.) uses plain copper tubes, and one (A. E. C.) has a single row of plain tubes in front of the bulk which are gilled. In 84 per cent the gilled tubes are vertical, in 16 per cent they are horizontal with top and side tanks, the latter containing baffle plates to direct the water from side to side half a dozen times in its circuit.

Radiators in approximately half the total number of chassis have some form of flexible mounting, the spring cushion and trunnion types of support being used in various forms. This is a tendency which has developed of late years, and, for obvious reasons, was called for.

### Electric Equipment

The magneto is universal for ignition purposes, but with an impulse starter in less than half a dozen cases. The new Straker-Squire has this supplementary fitting with a rod to bring it into operation by hand. But it is probable that impulse starters will be used widely within the next twelve months. Buyers are beginning to ask for them, knowing that three British magneto makers have standardized automatic types, and realizing that fuel is economized when the driver knows he will not have difficulty in starting the engine after brief stops for deliveries of goods.

Variable timing for the ignition is provided in 90 per cent of British trucks, but dynamo lighting is included in the chassis price of 10 per cent only, though of the remaining 90 per cent, half have provision for a dynamo with belt drive. Only one maker—Austin—provides an engine starter as standard, though it can be and is fitted in a few cases as an extra.

### Engine Control and Fuel Feed

The majority of truck engines have no governor on the pedal throttle—control. A hand lever for setting the slow running position is alone depended upon in 57 per cent. In a few cases a governor is provided as an extra; in 40 per cent of the engines it is a standard fitting. This is about the same proportion as before the war, but the governor connections are now usually enclosed completely to keep them from being tampered with by the driver. The protection thus afforded to parts which previously were tied up out of action by most drivers is very thorough. In some cases there is no inkling of their

existence, outwardly, and while this is of advantage from one point of view, it is the reverse when the governor spring adjustment is desirable, if not essential. On one make it is necessary to remove the cylinders to make this adjustment, and in others to remove the gear cover.

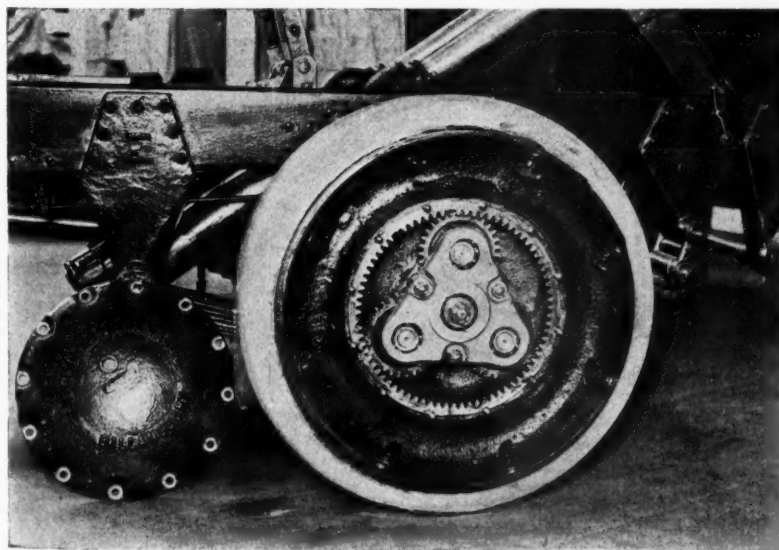
Vacuum fuel feed is not popular among British makers, and, though it appears on 7 per cent of the trucks against 93 per cent with gravity feed, the gain has been at the expense of the pressure system, which has been discarded entirely.

### Engine and Gearset Mounting

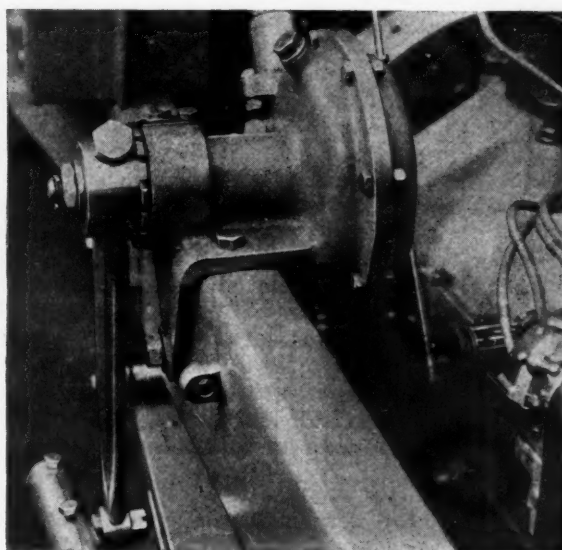
The unit power plant system is practically unknown in British trucks, Austins being the only firm which does not mount engine and gearset separately. Procedure in supporting the engine is about evenly divided between the main frame and the sub-frame method. The sub-frame sometimes carries the gearset as well, but usually the gear casing is suspended by three or four bolts from two cross members.

When no sub-frame is used, the engine almost invariably has a three-point suspension. Two practices are widely followed in this connection. The first is the fitting of a bridge forging, from which the front of the crankcase is suspended at the center over the partition between camgear casing and crank chamber proper, the rear end having either another bridge forging to which the rear face of the crankcase is bolted, or arms extending to the main frame. The second system, and the one more frequently adopted, is to support a forward extension of the crankcase in a trunnion bearing at the center of the front cross member, this extension being a bolted-on flanged and tapered cast steel unit. Four-point engine suspension in the main frame is, as inferred, practically obsolete. But sub-frame support is not so carefully considered as it deserves; it is often four-point and carries the engine by four arms—an arrangement obviously little better than no sub-frame at all and a direct four-point engine suspension.

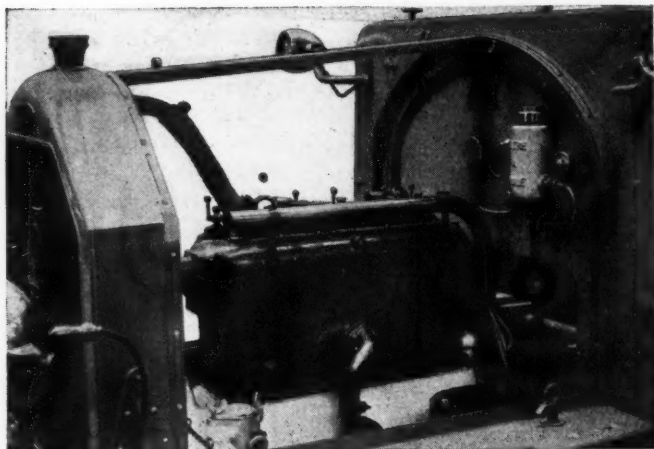
When engine and gearset are separate, the best arrangement of any, in the writer's opinion, is that of the Guy 2½ tonner, which has a three-point sub-frame for the two units, the sub-frame being of elongated horse-shoe shape in plan, of rolled steel, supported in a spherical trunnion bearing forward and depending from two universally jointed hangers at the back. As may be gathered,



*Renault rear wheels of 5 and 7-tonners have bevel driven axle and epicyclic gearing in rear wheel hubs*



*Mounting of De Dion steering above frame member, with adjustment for side play of worm shaft*



Vinot block-cast engine on 30 cwt. chassis; oil filter carried in front face of dashboard

a considerable degree of main frame distortion can occur without the sub-frame alignment being affected.

Gearsets in 70 per cent of mountings are hung below their supports, as distinct from resting upon them. They are usually bolted up from below at three points, enabling the casing to be easily lowered to the ground when the bolts have been removed.

#### Clutches and Coupling Shafts

The cone clutch, internal or external, is largely in the majority, being used in 79 per cent of chassis as compared with the single disk type, 19 per cent, and multi-plate, 2 per cent. While in most cases a larger diameter of cone is now provided, with a low spring pressure and fabric instead of leather facing, a few firms still persist in using comparatively small cones and the high spring pressure which is therefore required. As clutch pedals are almost invariably direct acting—the leverage is not increased by linkage—a "heavy" clutch results. This small cone and high spring pressure occurs in one or two new models, the 2 ton Commer for instance.

In clutch coupling shafts the fabric disk type of flexible joint is displacing the metallic type in one form or another, though occasionally one of each is fitted, the all-metal joint then being of the pot type with square sliding blocks on a T ended shaft.

#### Gearsets

Ball-bearings for gear-shafts, the latter splined, are general, and in 90 per cent of gearsets the shafts are side by side. The operating lever is on the right in 88 per cent, with exposed selector mechanism. Only infrequently is provision, apart from spring-backed plungers, made for locking the selector rods which are out of use. The new 4 to 5 ton Bristol has something quite out of the ordinary in selector mechanism, the striking forks in the box being "selected" by a lug on the semi-rotating shaft of the centrally placed gear lever, which is some 24 in. in front of the gearset.

One or two new models, notably the new 1½ ton Albion, have adjustable stuffing boxes, with felt packing, at the ends of the main gear shaft to prevent oil leakage; the gland nuts have radial holes for the insertion of the tip of a "tommy bar" when an adjustment is made.

#### Propeller Shafts and Universal Joints

The semi-enclosed propeller shaft, which is noticed on quite a large proportion of the American truck chassis at Olympia, has made a little headway among British makers. As a rule (69 per cent) the whole length is open; the semi-enclosed comes next (18 per cent) and the

all-enclosed last (13 per cent), the percentages given not including the coupling shaft between the gearset and countershaft when chain drive is used. The principal adherents of the semi-enclosed propeller shaft are Commer (one model out of four); Dennis (two out of three models) and Leyland (all five models). Open propeller shafts, if of any length over 48 in. or so, are tubular and up to 3¼ in. in diameter. The new Bristol, for instance, has a shaft 60 in. long and 3½ in. outside diameter, while in the new 3 to 5 ton Straker-Squire the shaft is of 3¼ in. diameter and over 100 in. in length with star joints at each end.

Of universal joints there is a considerable variety. The star or ring type with plain bearings for the pins occurs at both ends of 19 per cent of open shafts and with ball bearings in 14 per cent. Fabric disks are used on 32 per cent, block (sliding pot) joints occur at both ends of 2 per cent, while 33 per cent have a star at one end and a block at the other.

The flexible disk of fabric has made a great deal of headway and is being used on chassis of all sizes. In the larger type the most approved practice is to build up each disk of a series of units ¼ in. thick. These units are usually formed of eight plies of rubber impregnated fabric vulcanized together and riveted between bolt hole plates of various shapes. The plates preserve a clearance between the units of the whole disk and allow more flexibility without stressing the fabric. Where this plan has not been followed disks have often had a comparatively short life, and one of the vehicles at Olympia had one-unit disks which showed signs of early disintegration, although the chassis was new and had merely been run on its road tests.

The lubrication of metallic joints is not particularly well carried out in a number of cases, the joints often being exposed or at best enclosed in leather casings. In isolated instances, the lubricant is introduced by an oil or grease gun into a hole at the center of star joints, its escape at the outer ends of the bearing pins being prevented by the use of blind bushes.

#### Final Drives

The increased popularity of the worm drive—usually a straight worm, overhead—is a feature of the show. The internal gear type is not used on British trucks with one exception—the Lacre, the only well-known make which was not at Olympia. Side chains are still prominent and



Front of A. E. C. View shows prolonged second leaf of springs, tubular cross member, folding starting crank and radiator with row of plain tubes in front of main group which are gilled

have not lost must ground; they are used on 23 per cent of British trucks, worm on 52 per cent, double reduction gearing on 20 per cent and straight bevels on 5 per cent. In the latter category the Swiss Saurer is rather notable; it is shown at Olympia in its latest form with an unenclosed propeller shaft and a straight bevel final drive giving an 8 to 1 reduction from a 7-tooth bevel pinion.

When chains are used they are in nine cases out of ten completely enclosed and run in oil. Hallford, Commer (two models), Enfield and Allday are examples of the practice, the last two utilizing the back panel of the chain case as a radius member. Albion and Churchill chain driven models, on the other hand, have exposed roller chains.

### Rear Axles

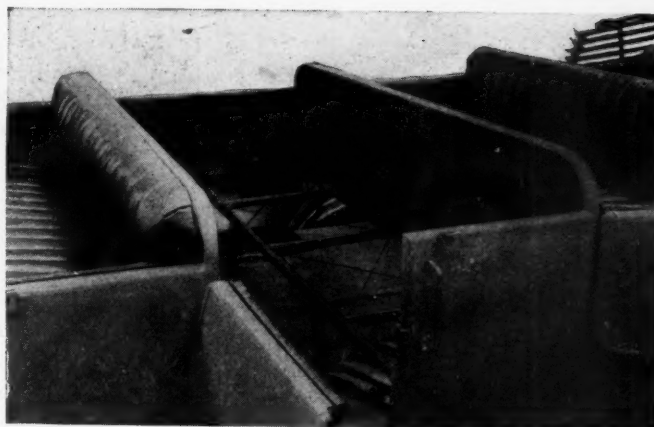
In the worm driven vehicles the favored axle design is similar to that appearing on some American truck chassis at Olympia, viz., a cast steel center with an opening at the top into which the worm and wheel are lowered with their bearing housings as a unit with the top cover of the casing. Wheel extensions integral with the center and as separate bolted-on and flanged units are equally numbered in this class of axle construction, which is closely followed in favor by the banjo type embodying a forged ring center with wheel extensions integral. The ring center is arranged horizontally for worm drives, and is enclosed above by the worm and worm wheel housing and cover plate, and below by an oil sump; for bevel or double reduction gears the ring is, of course, vertical, the gears in each case being mounted as a unit with the front cover.

Ball bearings are general for axle centers, but the majority of the trucks of over 2½ tons capacity have plain bearings for the wheels, usually of the floating variety but fixed in one or two cases—Albion for example.

The declining use of axle trusses is a noticeable feature of British back axles; they are rarely found except on built-up axles and not on all of those. Before the war a truss was almost general practice; integral exterior webs are now favored instead.

### Wheels Seldom of Wood

It is quite exceptional to find wheels of wood, and the disk wheel has lost a lot of ground, except when twin pneumatic tires are fitted—in the latter case the Michelin single disk type is used as a rule. The solid tired disk wheel, built up of two disks, the inner one flat and the outer dished with the apex of the cone near the hub end, has not, however, disappeared. It is still used by such



*Charabanc body shown by Morgan has airplane system of frame construction, viz. tubular members braced by steel wires. Same principle is being applied to touring car bodies by this firm of coach-builders*

well-known firms as Maudslay (one on model) and Thornycroft on all models.

The web spoked cast wheel has also lost a lot of ground, both it and the disk having been very largely superseded by the cast steel type with round spokes numbering either six or seven, usually the latter. The spoke ends are considerably flared in many cases where they run into the flat rim, though there is a wide diversity in design at this point. This type of wheel appears on 55 per cent of the trucks at Olympia, disk wheels on 21 per cent, web cast wheels on 15 per cent, wood and miscellaneous types on 9 per cent.

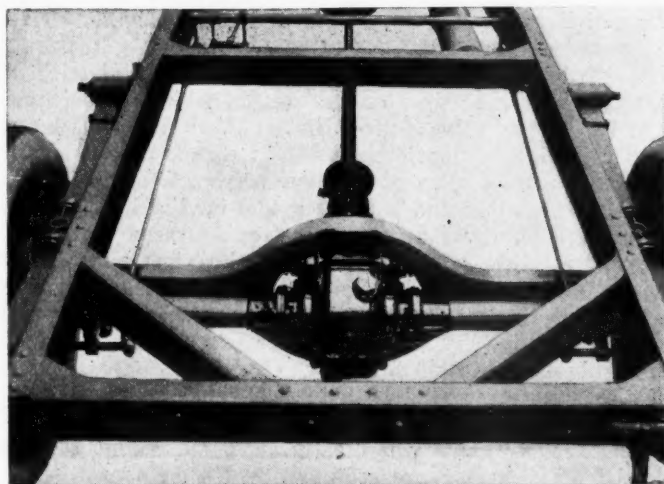
### Brake Tendencies and Location

In regard to brakes, general practice is to fit contracting type shoes acting upon a drum on the transmission behind the gearset and expanding shoes within wheel drums; in isolated cases an expanding transmission brake is arranged either in front (Guy, for example) or behind (Halley) the final drive on the rear axle casing. The transmission and wheel drum combination is used on 77 per cent, only 13 per cent having both pedal and hand operated shoes within the wheel drums; there is not one example of an external wheel brake.

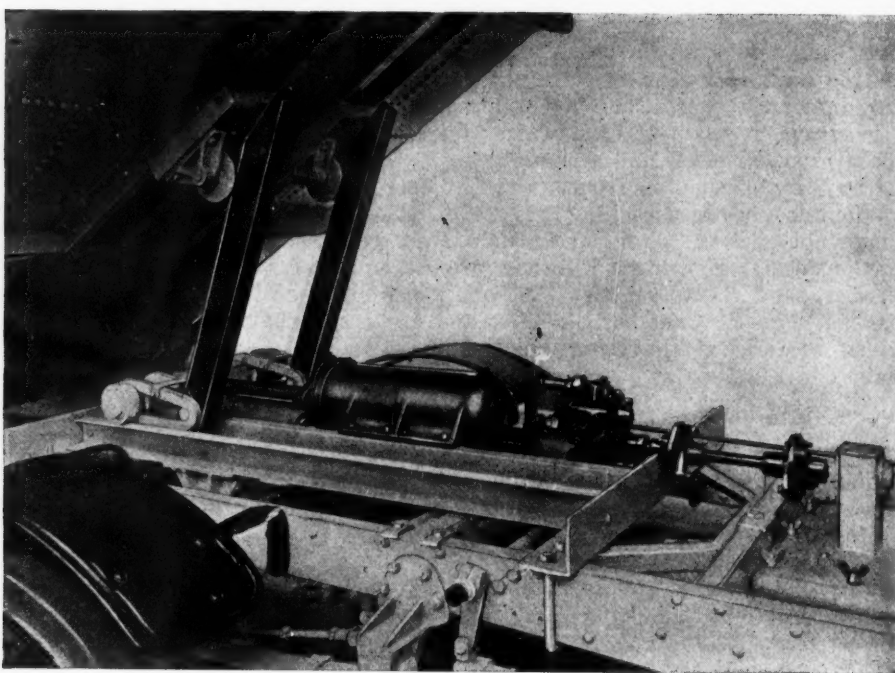
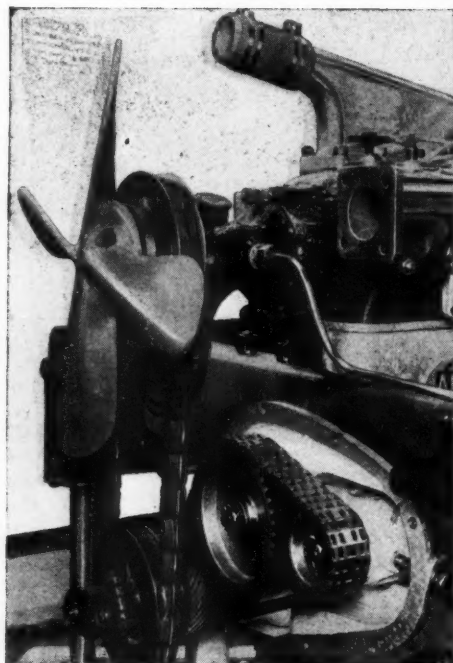
In connection with wheel brakes two tendencies have developed. The first is to leave the shoes exposed at both sides within the drum, and instead of attempting to exclude mud it is allowed to enter and find exit with equal freedom; the drums are merely rings of cast steel with lugs to secure them to the wheels. The second tendency is to increase very appreciably the area of friction surface, generally by the use of drums of greater diameter than were used prior to the war. The new Bristol 4-tonner, for example, has 18 x 4 in. wheel drums, and the Straker-Squire 22 x 7 in., though the latter is one of the few chassis with two pairs of shoes in each drum and no transmission brake. Generally, too, shaft drums are larger and wider, but there are notable exceptions, the Commer 2-tonner, for instance, having at the rear of the gearset a shoe brake with the drum only 8 in. diameter x 4 in. wide, as compared with the Bristol 14 x 4 in.

### Steering Gear and Connections

The worm and segment type of steering is widely used, the exceptions being of the worm and nut pattern. Complete worm wheels are not usual, nor is any means for adjusting the meshing of worm and wheel, or side play of the worm wheel shaft. The Bristol has a commendable arrangement to these ends, the shaft being carried



*Vinot differential and internal drive casing is carried by pressed steel member on the extensions of which the road wheels are mounted*



To the left—Front of A. E. C. engine with timing case cover removed. View shows cross member from which front of engine is suspended by two bolts, water accelerator or pump casing at rear end of fan shaft, and— at bottom right-hand corner—draw bolt for adjusting chain. To the right—Close view of Daimler hydraulic tipping gear, showing pump, ram cylinder and linkage of lifting levers

in plain bushes located in the split ends of the gear housing extensions by pinch bolts; the bushes have a slightly eccentric bore for mesh adjustment and can be moved axially to take up side play.

Ball ends for the steering levers are most in favor, but the design of rod ends varies considerably; the rods may have capped ends secured by two or three bolts, or tubular ends with a threaded plug, the cap or plug forming half the ball socket; to secure the plug the usual provision is a pinch bolt, the pre-war plan of using a split pin through tube and plug having been discarded. On the other hand, a short universal link between eyes on lever and coupling rod is often seen, and here again there is diversity of method in applying the principle.

In respect to swivel axles and steering pivots there has been remarkably little change since 1913, and yet there is plenty of room for it. That is to say, there are only a few half-hearted attempts to make the prolongation of pivot pin axis intercept the point of tire contact with the ground. Vertical pins appear in 72 per cent of axles and inclined in but 28 per cent, but even in the latter the inclination is slight and despite a slight splaying of wheels there is often 2 in. difference between pin axis prolongation and tire contact at the ground. With the majority of vertical pins the difference amounts to over 4 in.

#### General

There are very few "assembled" details in British truck chassis. Only a few firms use engines other than those made by themselves. The Dorman & Tylor engines are utilized by W. & G. and A. E. C. (one model) respectively, and by one or two other makers. But gearsets, clutches and back axles are made individually.

Each truck maker, too, has his own ideas, and arranges that they are adopted, in connection with frame sides, cross members, front axles, steering gear, controls, radiators and other items. Naturally, these special designs with comparatively small outputs—twenty per week is considered a good showing—means high cost of production in respect of the chassis as a whole, and the following may be taken as typical of British prices for chassis of the capacities named, with solid tires in each case:

30 cwt.	(3,360 lb.)	£725—£900	(\$3,625—\$4,500)
2 ton	(4,480 lb.)	£900—£1,025	(\$4,500—\$5,125)
2½ ton	(5,600 lb.)	£900—£1,120	(\$4,500—\$5,600)
3 ton	(6,720 lb.)	£1,000—£1,200	(\$5,000—\$6,000)
4 ton	(8,960 lb.)	£1,050—£1,300	(\$5,250—\$6,500)
5 ton	(11,200 lb.)	£1,240—£1,440	(\$6,200—\$7,425)

#### Imported Chassis

Among the imported trucks exhibited are eighteen of American manufacture, these including Federal, Garford, G.M.C., Hawkeye, Overland, Packard, Selden, Traffic and Republic.

There are seven French makes, among them Brasier 3½ and 5 ton models; the former on pneumatics (Michelin), twin and single, and having a tire pump consisting of oscillating plungers enclosed within and operated by a hollow friction wheel over the flywheel.

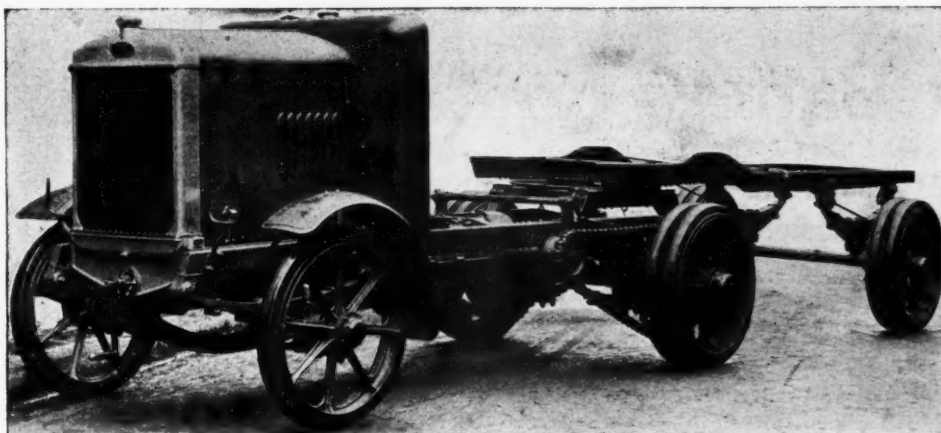
Delaunay Belleville has a four-wheel drive tractor with a wheelbase of 134 in. carrying 2½ tons and hauling loads up to 25 tons on a trailer. The tractor engine has four cylinders 5 x 6¼ in. and is under the elevated driving seat.

Panhard has 30 cwt. and 3 ton trucks, the first with a four-cylinder side valve engine 3½ x 5½ in., and the second a sleeve valve four-cylinder 3¾ x 5½ in., both with Michelin pneumatic tires.

Renault has a display of five trucks from 1 ton to 7 tons capacity, the latter and a 5 ton model having bevel drive to the back axle and a final reduction by means of planetary gearing in each back wheel, the sun and planet pinions being exposed by the removal of a 16 in. cover plate which displaces the usual hub cap; the largest model has a 5 x 6¼ in. engine, with the radiator at the front of the dashboard as in all others.

Unics are represented by a taxicab and two trucks for 30 cwt. and 2 ton loads. The latter are of similar design, but the heavier has a very neatly arranged double reduction drive and a long pressed steel torque member with a front extension in the form of a laminated spring.

Two features of note are apparent in the 30 cwt. Vinot chassis, i.e., a pressed steel load-carrying rear axle with a



*Scammell tractor with semi-trailer. Brakes on trailer wheels operated by plunger passing through hollow central pivot of trailer table. Engine has bore and stroke of 5 x 5½ in. and overhead push-rod operated valves in detachable head*

separate casing for the differential and the shafts of the internal gear drive, and a large oil filter mounted high up on the front face of the dashboard, a method of making this unit accessible which might be adopted after it had been omitted from the crankcase design.

De Dion shows several examples of truck chassis, one completed as a street cleaner and sprinkler, but the star among the imported chassis, so far as exterior finish, if not complexity of design, is concerned, is the live axle Saurer for 2 ton loads. Every detail of its 4 x 6¾ in. engine and chassis has a finish which would eclipse the majority of private car chassis at any exhibition. But beyond this, the number and character of the mechanical refinements are—well, almost awe-inspiring.

#### New Ideas in Saurer

The Saurer "engine brake" is fitted; so is a connection between starting handle and magneto to retard the timing for starting; there are throttle, engine brake and ignition levers over the steering wheel and a hot air control on the dash. A throttle governor cuts out at 1000 r.p.m. on the indirect gears, but by linkage running back to the gearset the maximum speed is reduced to 800 r.p.m. when the top gear is engaged. A helical keyed coupling drives the magneto and by this means the ignition timing is varied—a Saurer plan for fourteen years past. The engine lubrication system comprises tandem plunger pumps, one of comparatively large capacity circulating the small quantity of lubricant in the crankcase and the other serving constantly to add small supplies from a reserve tank to make up loss.

The Saurer engine has block cast cylinders and the engine and gearset are mounted as a lengthy unit from three points, a pair of pressed brackets supporting the rear end and a central trunnion bearing the front. The flywheel and cone clutch are semi-enclosed, the flywheel having a steel extension with five circumferential tongues made by saw cuts to form flexible sections for first engagement of the cone. The rear wheels are canted, a limited amount of universality for the hollow drive shafts being obtained by making each of the

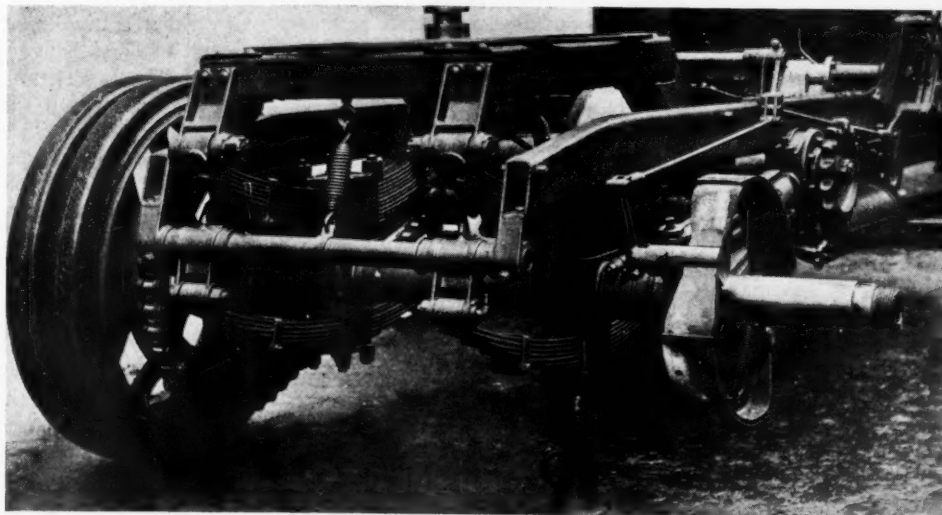
latter in two parts with a form of dog clutch engagement between the units. Both sets of brake shoes expand within the rear wheel drums, which are of 22 in. diameter and 7 in. wide. This 2-ton chassis is sold at £1,280 (\$6,400) in England, the 5-tonner being priced at £1,800 (\$9,000), with 4¾ x 7½ in. engine.

Fiat has a full display consisting of five trucks, a taxicab, an ambulance and an agricultural tractor, the only special feature being a rear and side tipping gear, hand operated. Saurer also shows an hydraulically operated gear for tipping to either side or to the rear; the body in this case is mounted on four pedestals with spherical ends and is locked to two of the four points of support when being tipped in one direction or another; the connections from the ram are universally jointed links which adapt themselves to the various movements of the body irrespective of the direction of tip.

#### International Patent Agreement

ON June 30 an agreement was entered into between France, Germany, Netherlands, Poland, Portugal, Sweden, Switzerland, the Czescho-Slovak State and Tunisia with reference to the maintenance and re-establishment of the industrial property rights affected by the World War. Under this agreement, any patent or design patent applications which were made in one of the contracting countries after Aug. 1, 1913, can be made in any of the other countries during the next six months, as of the date of the original application. The same applies to trademarks applied for after April 1, 1914. Inventors having made applications for patents in their own country can secure full protection in the other countries, except that any firms in the other countries which have already used the patent in question have the right of prior use.

THE (British) Fuel Research Board seems to favor the use of town gas and coke oven gas in motor omnibuses and passenger cars, and, given light and safe containers and suitable roadside refilling stations, apparently believes that great economy will result from its use.



*Rear end of Scammell tractor; showing table frame of trailer mounted independently on semi-elliptic springs*

# A Compact Battery Ignition System

A novel arrangement combining usual battery ignition units into a neat assembly resembling the magneto in appearance and method of connection with engine. Is design of a Belgian engineer, Vital Paquit. Advantages include simplicity in construction and absence of high speed parts.

**S**INCE high tension battery ignition has become the standard for passenger car engines, the elements of an ignition system, aside from the current source, include the coil, the interrupter, the condenser, the distributor, the switch and the wiring. For engines of four or more cylinders none of these elements can be left out, and no more are required, hence there is a certain similarity in all battery ignition systems, in that all comprise exactly the same parts. But in the construction of these parts and in their relative arrangement there is considerable latitude, and it is upon these details that ignition experts are expending their ingenuity.

The system illustrated herewith, and which is due to Vital Paquit, a Belgian engineer, comprises all the elements of the conventional battery system, but some of these parts are of quite different design and the whole is neatly combined in a compact and substantial unit which fits the standard magneto base and drive shaft and resembles a magneto in appearance.

The approach to the magneto form of outline has been chosen not for the purpose of deception but because it possesses practical advantages. In this form all of the elements of the magneto system with the exception of the switch—and this is an advantage which has often been claimed for the magneto—are combined in a single assembly, with the result that the outside wiring is reduced to a minimum. In fact, the wiring is exactly the same as that of a magneto—a high tension cable from the distributor terminals to each of the spark plugs, and a single low tension cable from the instrument to ground, this circuit including the battery and the switch.

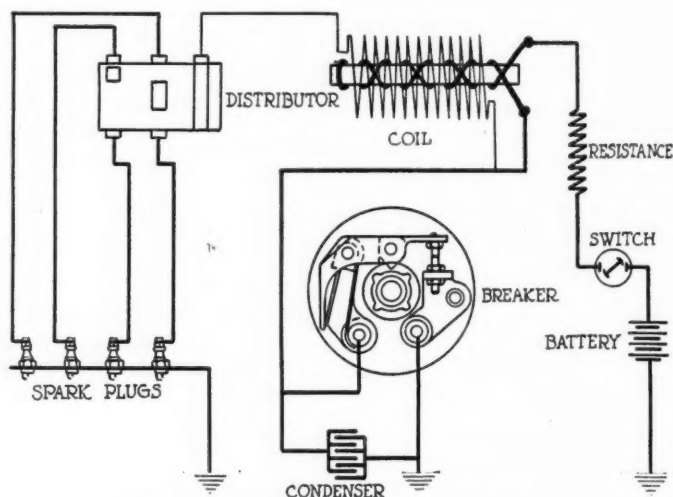
## Has Appearance of Magneto

The instrument can probably be best described with reference to its similarity to a magneto. The space ordinarily occupied by the magneto armature is here taken up by the high tension distributor. The distributor shaft naturally must be driven at such a speed that it makes one revolution during the period of one engine cycle; that is, it must be driven at one-half crankshaft speed.

The high tension distributor is that part of the Paquito system which differs most radically from the corresponding part of the conventional battery ignition system. It consists of a drum of bakelite, which is molded to a knurled steel shaft, and is provided, in the case of the four-cylinder magneto, with two distributor segments of brass,

molded into the bakelite. These distributor segments are offset relative to each other in the direction of the length of the distributor drum and arranged at quarters circumferentially. Adapted to make electrical contact with each distributor segment are two distributor brushes which are guided in brass brush holders, molded into bakelite side plates, secured to the sides of the aluminum base casting. The brush holder extends to within 1/32 in. of the surface of the distributor drum and thus prevents shattering of the brush.

The brush-holders are in the form of L shaped brass fittings, the horizontal portion of which contains the brush and the vertical portion of which extends up through the side plate of bakelite, and forms a dowel socket for a pin on the top portion of the ignition unit, which contains the coil. In a four-cylinder ignition unit there are four of these dowel sockets and connections. The dowel pins, which are connectors of the snap type, are molded into the bakelite upper section of the ignition unit, and connections extend from them to the high tension terminals, which are located centrally in the top of the coil housing.

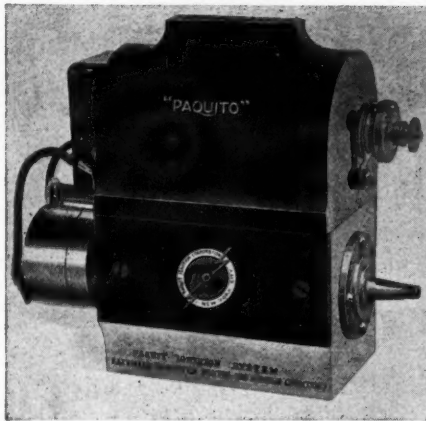
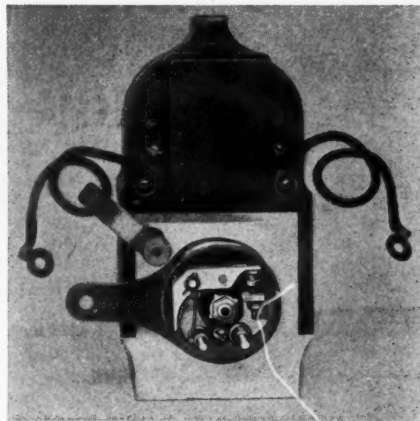
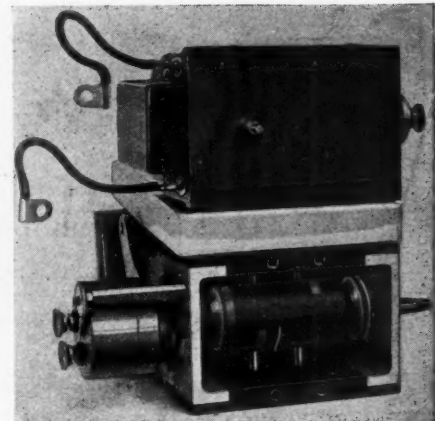


Wiring diagram of four-cylinder system

The interrupter is located at one end of the distributor shaft, and is very similar in construction to a magneto interrupter. The cam for operating it is forced by a nut against a conical portion of the shaft. This cam has as many lobes as there are cylinders to be fired. The interrupter housing is made of brass, in two parts, one forming the base on which the interrupter parts are mounted, and the other the housing proper. The insulation plate of cream colored fiber is secured to the base. The interrupter arm is of bell crank form, one arm carrying the movable contact point and the other the cam follower and the two straight, flat interrupter springs. The contact points are made of platinum-iridium alloy and they open about 0.010 in.

## Details of Interrupter

As the interrupter shaft makes one revolution for every two revolutions of the engine crankshaft, the interrupter cam must be provided with a number of lobes equal to the number of cylinders to be fired. A cam follower or shoe of bakelite is used, and we are informed that after 3500 miles of operation with one of these ignition units, no wear on the shoe could be detected. The cover of the interrupter is held in place by the nuts on the two binding

*Paquito ignition unit**End view, showing breaker**Upper and lower parts on side*

screws from which connection is made to the condenser, while the entire interrupter housing is held in place by means of the usual flat spring supported by a post.

The condenser, which has mica insulation, is provided with a metal cover and secured to end of the coil housing directly about the interrupter, hence the connections from the interrupter to the condenser are very short. The condenser has a capacity of 0.891 microfarad. The object of mounting the condenser in a separate cover outside the main ignition unit housing is to make it easily removable in case repairs should be needed.

As already pointed out, the coil is enclosed in the upper bakelite part, which has an opening at the bottom, closed by a rectangular plate of bakelite. The high tension carbon brush projects downward from this upper section of the ignition unit and bears on a brass contact ring in the distributor drum. On the opposite end of the coil from the condenser is mounted the regulating resistance, which is connected in circuit with the primary winding of the coil. The object of this resistance is to make the current consumption more nearly equal at high and low speeds, respectively, and it also prevents burning out of the coil in case the switch should be accidentally left closed. This resistance consists of a small coil of fine nichrome wire which is curved around a porcelain block, the wire being bare and exposed to the atmosphere, so as to facilitate the radiation of heat from it. It is claimed to be

absolutely impossible to burn out the coil, even if the engine should be stopped when the interrupter contact is closed.

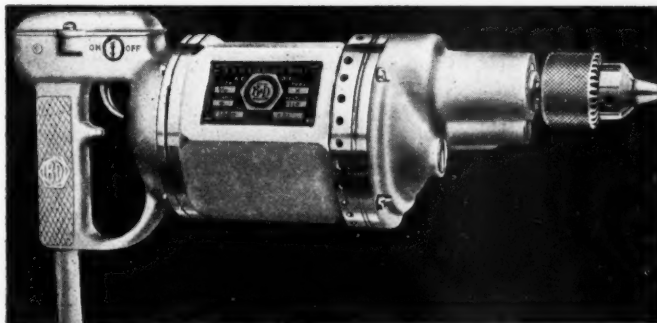
The distributor shaft is mounted on two Norma ball bearings, which require a few drops of oil every 5000 miles. These bearings are mounted in bearing plates of brass. The same base and rotor are used for both four and six-cylinder ignition units, but the interrupter cam has a different number of lobes, and there are also a different number of high tension terminals. It is a very easy matter to convert a machine from right-hand to left-hand rotation, as all that is required is to readjust the interrupter cam, which is held in place by pressure. Owing to the construction of the interrupter, the instrument must be so linked up on the car that with the spark lever in full retard position, the engine fires  $\frac{1}{4}$  in. over dead-center.

Ignition units for eight and twelve-cylinder engines will also be made, but they will have a different base from the units for four and six-cylinder engines. The high tension terminals will be arranged in two lines instead of in a single line.

Among the advantages claimed for this system are that it is exceedingly simple in construction and that there are no high speed parts, consequently the parts should wear well. The system produces an effective spark, and even when the battery is so low that the horn can no longer be operated, it gives a spark that will fire a good charge.

## Body Builders Electric Drill

**D**RILLS for use in the manufacture of automobile bodies should be easy to handle and in addition have speed and endurance, because the work involves quantity production and therefore calls for continuous use of tools. A special 5/16 in. drill for this purpose has been designed by engineers of the Black & Decker Mfg. Co.

*B & D electric drill*

The gears of this "body builder's special" are hardened and mounted on ground shafts. The light weight of the drill results from the use of aluminum for the motor and gear casing. The motor is cooled by forced circulation of air through the field frame and armature winding. It develops  $\frac{1}{4}$  hp. and gives the drill a no-load speed of 1480 r.p.m. The control is by means of a pistol grip and trigger switch.

The drill is equipped with a three-jaw chuck for straight shank drill bits up to 5/16 in., 15 ft. of duplex electric cable and separable attachment plug. It runs on either alternating or direct current and is furnished for either 110 v., 220 v. or 32 v.

**A**PPARATUS has been set up at the Bureau of Standards and tests commenced to determine the performance of fan belts for the Motor Transport Corps. The apparatus consists of a motor driving a typical automobile cooling fan by means of a belt; the slippage can be determined by means of revolution counters attached to the motor and the fan pulley.

# Conservative Body Lines Predominated at New York Salon

Cabriolet a favorite on many chassis. Angular lines abandoned in general in favor of slightly rounded corners and surfaces. Many wire wheels used, especially on foreign chassis, but disk wheel is gaining in popularity. Crowned mudguard with pocket for carrying spare wheel is popular. Inclined windshield is being abandoned on majority of enclosed bodies.

By George J. Mercer

**M**ANY of the bodies shown at the New York Salon are exact reproductions of those exhibited at the last Salon. Radical departure in lines is seldom in evidence in more than one or two models at this annual exhibit. Conservative lines always predominate while refinement and attention to details are quite the usual thing.

In spite of a similarity in lines to those of bodies shown last year, there is nothing stereotyped in this resemblance because there is always something a little different in the trimming design and color, the paint finish or the appointments.

Quantity manufacturers are generally disappointed in the Salon for the designs exhibited do not accurately represent the popular type for the coming year. The exhibit is usually marked by progressive conservatism and the central idea is to show bodies of the town car class.

The town cars were well represented and varied in design. These included the brougham, one of which was shown by Brewster, with solid quarter panel, steps in place of runningboards and six fenders, as well as the more popular cabriolet. The foreign cars particularly favor this latter type of body. In fact, European cars have ever been partial to the falling top. During the war, when European influence was less felt in body design, the falling top body was seldom seen for other than town car use. The sedan and the coupe were also exhibited. It will be seen by reference to the accompanying cuts that where the body lines are rounded, the effect is more harmonious than in those bodies with the more severe straight lines. The majority of the bodies were of this class, indicating that the day of the angular line has vanished in favor of smooth slightly rounded surfaces. The slanting windshield for closed bodies is also disappearing. Hardly a closed body was to be seen in which

the front was not nearly perpendicular. A slight rake of about  $\frac{3}{4}$  in. is good to avoid light flashes from street lamps.

The roofs also looked best on those bodies, in which the edges were rounded to blend with the side and back panels, the point where one begins and the other ends being lost. This makes the roof appear a trifle heavier, but for work of the type shown, extreme lightness in appearance is not an essential. The majority of the bodies

are smaller than in years past, and thus are actually lighter than heretofore.

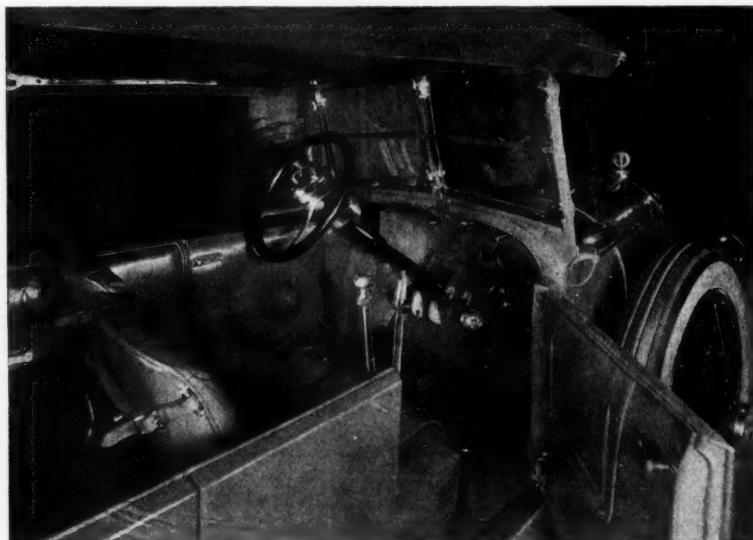
Wire wheels were used to a larger extent than last year. This is due to the greater number of foreign exhibitors. The wire wheel has been replaced to a large extent among American manufacturers by the disk wheel, which will be used still more extensively when the difference in cost of production becomes less.

The long, full-crowned mudguard was by far the most used, and the front guard was pocketed on many cars to carry the spare tire, as will be seen by accom-

panying cuts of the Rolls-Royce, Brewster, Winton, Rubay, Sunbeam, Fleetwood and Delage.

Pillar lamps were rarely used and dash lamps were used on perhaps half the cars.

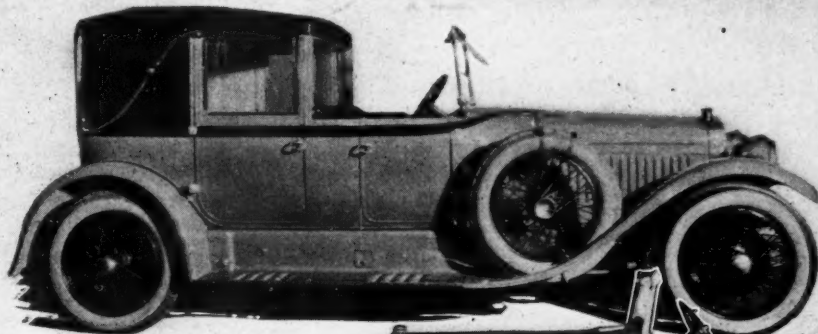
Many of the touring bodies had lower sides than usual, examples of this being mounted on the Daniels, Winton and Lanchester chassis. An effort to make the touring body appear like a runabout body was noticed, the apparent intention being to secure the comfort of the one and the appearance of the other. The appearance of a very low-sided, close-coupled four-passenger touring body with carrying space back of the rear seat is similar to that of the speedster type, but some of these bodies had more of the runabout appearance than the average speedster has.



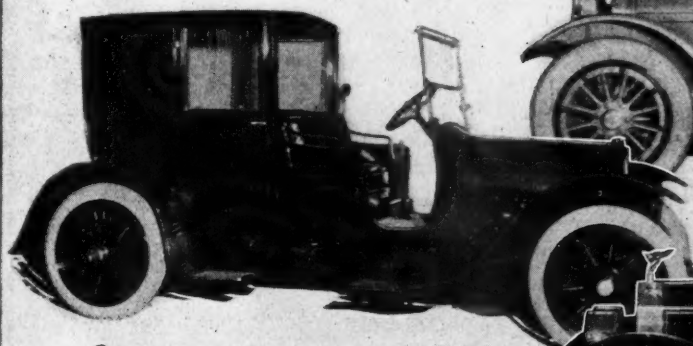
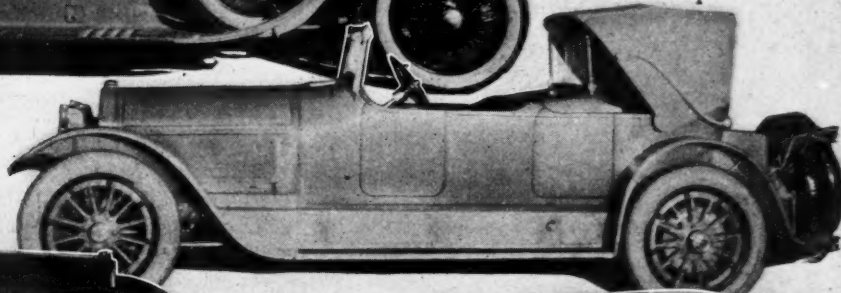
*Minerva with movable seats, showing foot pillows and location of instruments*

## Representative Bodies Exhibited at New York Salon

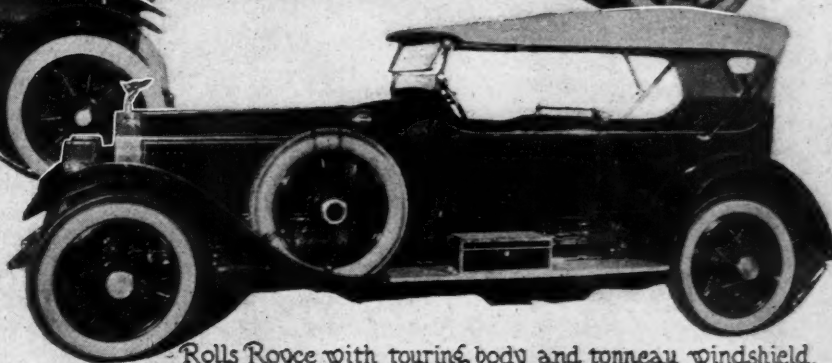
Delage fitted with compact cabriolet body having wide belt moulding stripe.



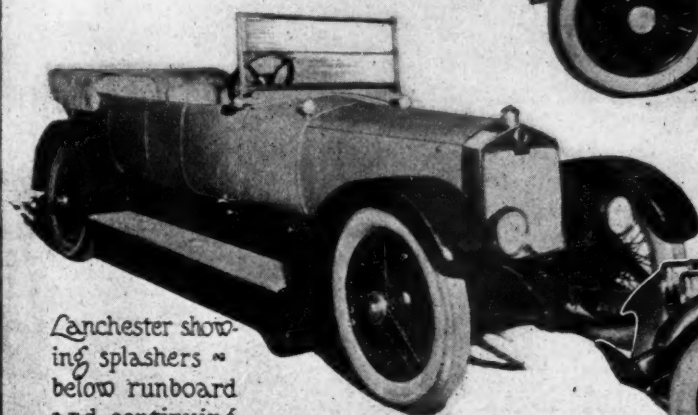
Locomobile showing extension of second cowl for tonneau protection.



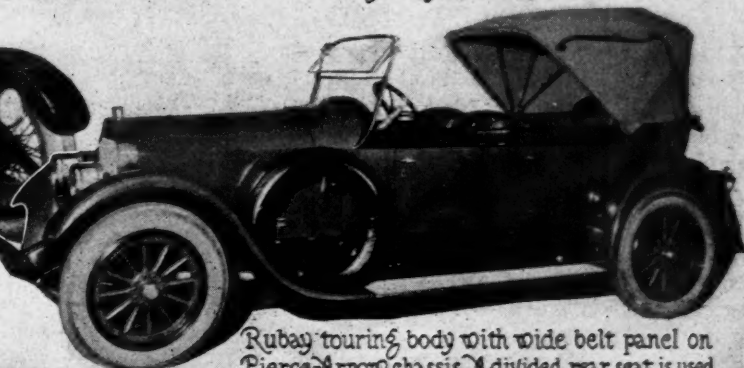
Brewster with town car having steps and six fenders. ~ ~ ~



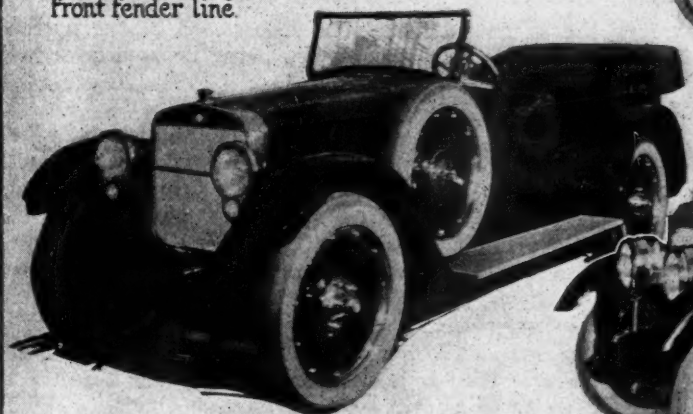
Rolls Royce with touring body and tonneau windshield.



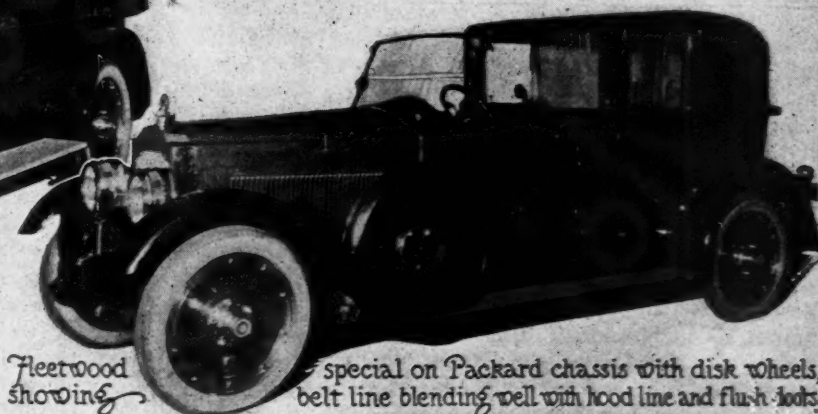
Lanchester showing splashers ~ below runboard and continuing front fender line.



Rubay touring body with wide belt panel on Pierce-Arrow chassis. A divided rear seat is used.

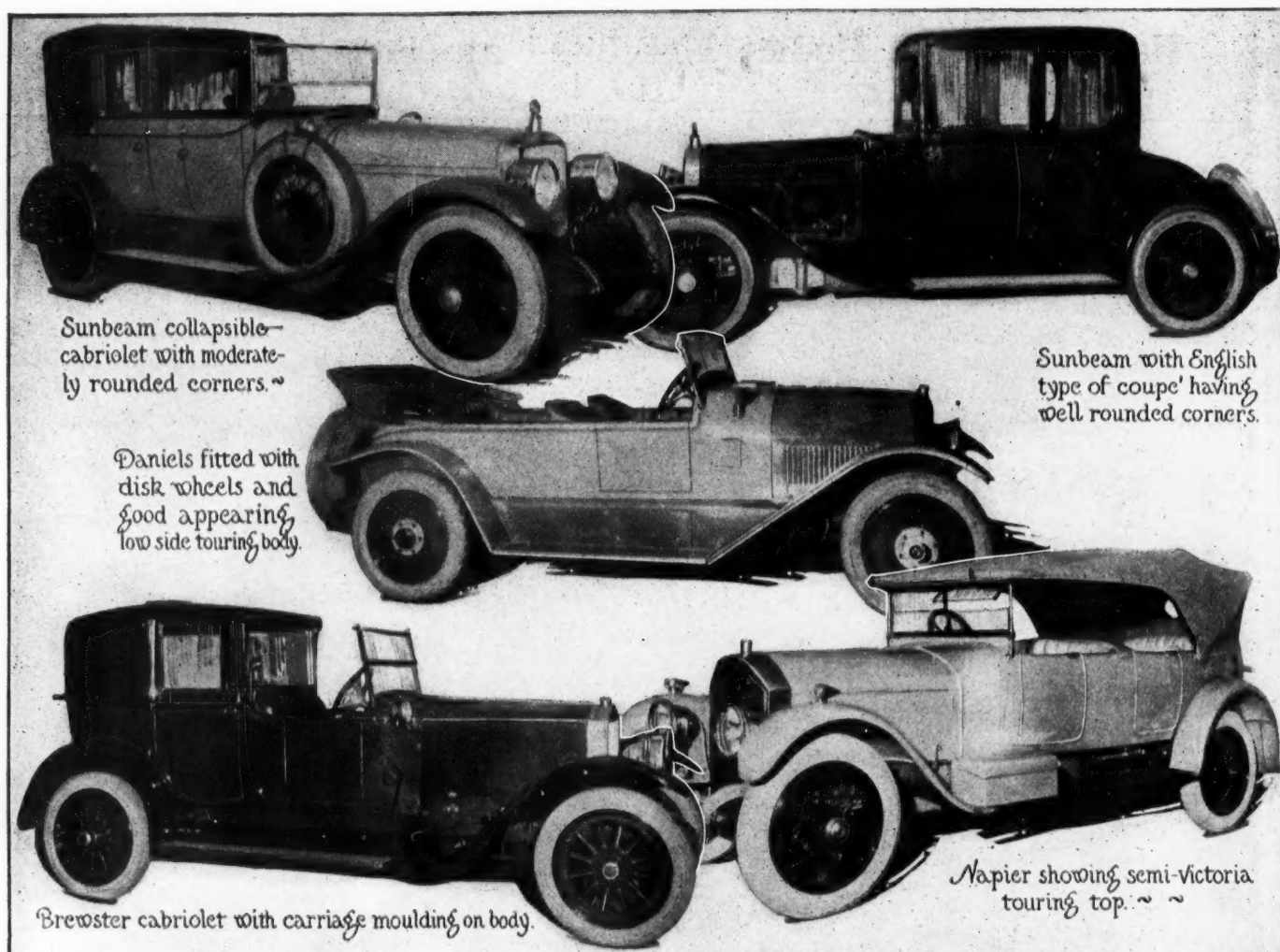


Vinton with touring body and disk wheels.



Fleetwood showing

special on Packard chassis with disk wheels, belt line blending well with hood line and flush look.



The front part of the Minerva pictured in one cut shows an unusual arrangement of instruments under the dash, as well as a novel type of runningboard. The sliding front seats, robe rails, victoria top and tonneau windshield are also worthy of careful notice.

Other cuts show a Napier chassis carrying a body with semi-victoria top and divided windshield; and a special body on a Locomobile chassis had a victoria top and an extended second cowl carrying a tonneau windshield. The Lanchester used splashers below the runningboard.

## Molding Sand for Light Steel Casting

ACCORDING to R. J. Dunderdale, writing in *Engineering*, the molding sand required in steel foundries specializing in light castings for automotive and similar work differs completely from that used for iron foundry work, and considerably, both in character and treatment from that used for heavy steel castings. Its physical condition should be hard, sharp and not easily friable. Chemically, it should contain 97 per cent to 98 per cent of silica, and as little matter of other kinds as possible, though a small quantity of iron is not objectionable. In regard to size, it is probably as well that the sand itself should not pass through an 80-mesh, as its texture will be rendered decidedly finer than this by the clay used for bonding. The best clays for this purpose contain about 30 per cent of alumina, as little organic matter as possible, and, according to Professor Boswell, a certain amount of iron is an advantage. The sand and the clay to be used should be very thoroughly mixed and milled and the moisture of the resulting mixture can be as much below 4 per cent as will

allow the sand to take a good impression of the pattern and not crumble or fall out when being dressed or turned over.

ALTHOUGH there are places in London and elsewhere where rubber has been used as a road surfacing material over small areas it has hitherto only been adopted for the purpose of deadening the sound of traffic in situations where quiet is essential. The idea of employing rubber on a large scale, however, has long been mooted, but it has been left for the Southwark Borough Council, states the *Surveyor*, to give this question a definite trial on a road subject to heavy traffic—namely, the Borough High Street. Half only of the road is being faced with rubber, so as to afford a comparison in efficiency. The new material is being laid in flat slabs three-quarters of an inch in thickness, attached to steel plates, from which project broadly flanged studs, which are gripped by the concrete foundation.

# Effect of Gear Ratio on Car Economy

Methods of obtaining the best car performance with respect to fuel economy when using various gear ratios are outlined by the authors who also deal with other important fundamental factors affecting fuel consumption and give valuable experimental data to illustrate the points made.

By J. N. Golten and Allan Neumann\*

ONE of the problems of the hour is that of fuel economy, which to the motor using public is a matter of miles per gallon. Much has been done to increase the economy, and to improve car performance, by the re-design of the engine and various other parts of the car; but in the opinion of the writers the full economic capabilities of the modern engine, or of the car considered as a whole, are not being realized.

After the completion of a new engine or car, the manufacturers generally try out several carburetors, and that apparently giving the best all around performance is selected. Such a decision on carburetor equipment is rarely made in the light of a full knowledge of the car's possibilities.

A comparatively simple method of determining the optimum performance and thus giving a basis for comparison with actual performance, is given in the following paragraphs.

## Method of Determining Optimum Performance

For any given car speed  $S$  (miles per hour), the miles per gallon ( $M/G$ ) can be expressed as the ratio of the distance covered in the time  $T$  to the fuel consumed in the same time.

$$\text{Distance} = ST.$$

$$\text{Fuel consumption} = (f_m HP_s T),$$

where  $f_m$  is the minimum brake specific fuel consumption

\*Engineers, Carburetor Division, Stewart-Warner Speedometer Corp.

(pounds fuel per hp.-hour), at the horsepower  $HP_s$  required to drive the car at constant speed  $S$ . Therefore,

$$\frac{M}{G} = \frac{CST}{f_m HP_s T} = \frac{CS}{f_m HP_s} \dots \dots \dots (1)$$

$C$  being a conversion factor from pounds to gallons, generally taken as 6.2 for gasoline.

To make this formula usable  $f_m$  and  $HP_s$  must be experimentally determined and expressed in terms of  $S$ .

The method of determining the minimum brake specific fuel consumption is thoroughly described in P. S. Tice's article, "Carburetor Requirements of a Typical Gas Engine," in the June 24 issue of AUTOMOTIVE INDUSTRIES. A brief description of the method is given herewith.

At any definite speed, and at each of several manifold

pressures, varying from that at idling to open throttle, the mixture ratio is varied by small steps from the leanest possible mixture at which the engine will run steadily, to a mixture so rich in fuel as to result in an appreciable loss in output. The spark timing is in all cases adjusted to that position giving maximum torque. Fuel, torque and speed readings are recorded during each run. A plotting is then made between  $P_b$  (brake mean effective pressure) and  $f_b$  (brake specific fuel consumption, lb. fuel per hp.-hour) for each manifold pressure. This will give a series of curves as shown in Fig. 1. A line drawn tangent to the several curves of the group is an expression of the minimum brake specific fuel consumption ( $f_m$ ) obtainable over the load range at that particular speed. However, the variation in this tangent curve with speed is so slight that it may be considered as being independent of speed.

## Car Resistance

$HP_s$  is determined by means of accelerometer tests. (See P. M. Heldt's article, "Acceleration of the Automobile and Its Measurement," appearing in the June 10 issue of AUTOMOTIVE INDUSTRIES.) The car is brought up to a certain speed, power then shut off, and the car allowed to decelerate, accelerometer readings being taken at various speeds. From these readings the  $HP_s$  can be calculated by the formula

$$HP_s = \frac{r W_t S}{375} \dots \dots \dots (2)$$

where  $r$  is the accelerometer readings in lb. per ton and  $W_t$  is the weight of the car in tons. A plotting is now

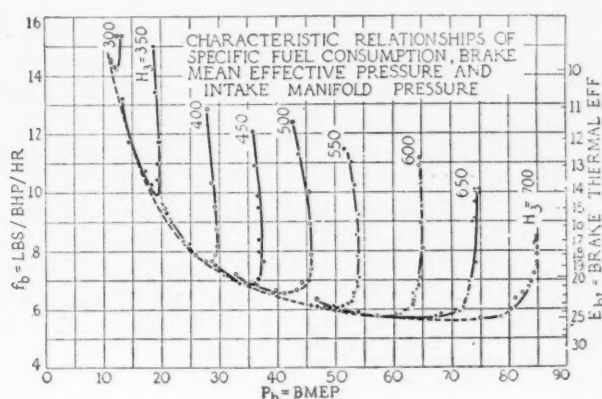


Fig. 1

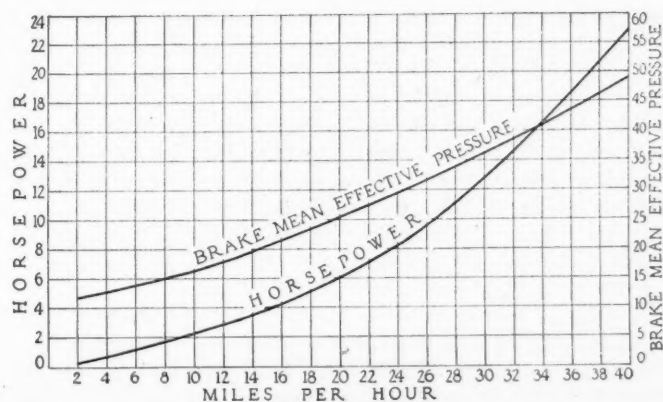
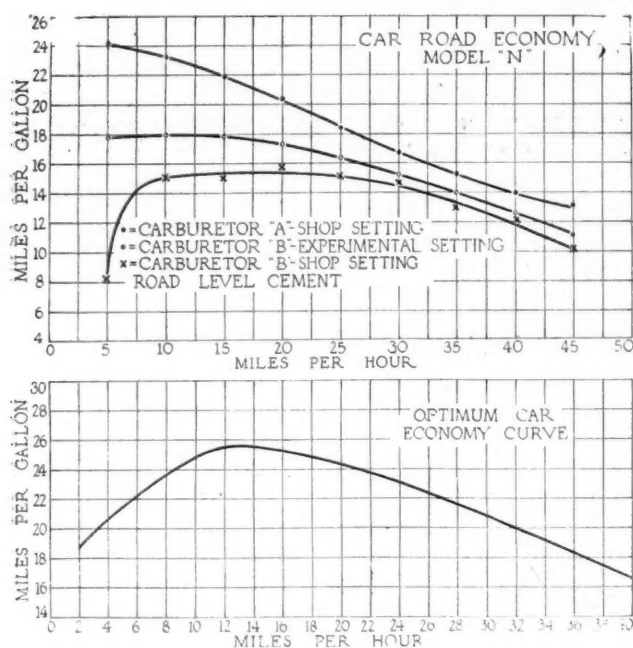


Fig. 2



Below—Fig. 3. Above—Fig. 4

made between  $HP_s$  and  $S$ , and likewise one between  $P_s$  and  $S$ ,  $P_s$  being determined by the formula

$$P_s = \frac{3000 HP_s D}{CLB^2 SG} = K_1 \frac{HP_s}{S} \dots \dots \dots (3)$$

where

$$K_1 = \frac{3000 D}{CLB^2 G}$$

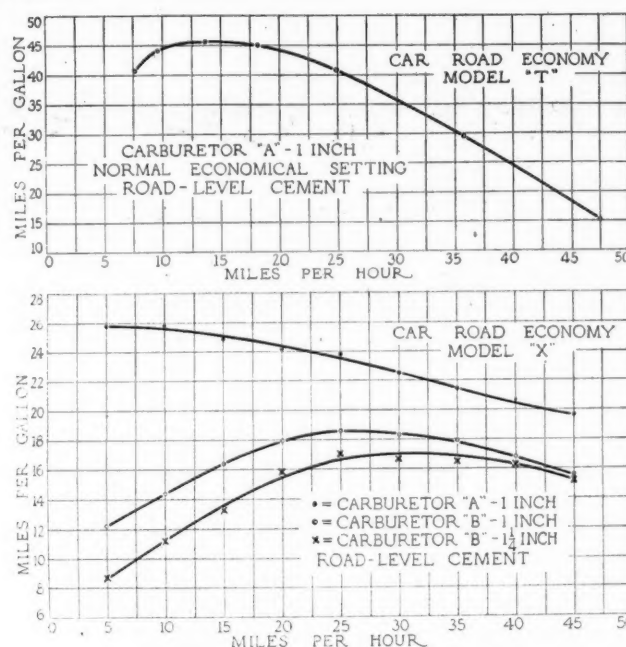
and  $P_s$  is the brake mean effective pressure developed by the engine at the speed  $S$ .  $D$  is the diameter of the rear wheels in inches,  $C$  is the number of cylinders,  $L$  is the length of engine stroke in inches,  $B$  is the cylinder bore in inches, and  $G$  is the gear ratio. Typical curves are shown in Fig. 2.

The curve of optimum car economy is determined as follows: At any definite car speed,  $HP_s$  and  $P_s$  are determined from the rolling resistance curves, and knowing  $P_s$ ,  $f_m$  is obtained from the fuel utilization plot (Fig. 1). Substituting the values  $S$ ,  $HP_s$ , and  $f_m$  in formula 1, miles per gallon is obtained. A typical curve is shown in Fig. 3. This curve is a true expression of the maximum economy that can possibly be obtained with that car, engine, and gear ratio, regardless of the carburetor performance. This economy can only be realized in practice when the carburetor compensation is such as to give the mixture proportions that result in minimum fuel consumption at all speeds and loads.

### Optimum Performance

These optimum results are rarely, if ever, obtained in practice, due to the fact that the average present day carburetor does not possess the required compensation characteristics. However, some carburetors more nearly realize the desired compensation characteristics than others, with a resulting large increase in economy without sacrifice in performance.

A striking comparison of the results obtained in typical modern touring cars with two carburetors, "A" and "B," is shown in Figs. 5 and 6. Carburetor "A" is non-adjustable, and inherently possesses correct compensation characteristics. Carburetor "B" is a well-known make. In Fig. 4, curve 1 shows the mileage obtained at various speeds with carburetor "A." Curve 2 shows the results obtained with carburetor "B" when adjusted by a carbu-



Below—Fig. 5. Above—Fig. 6

reter factory representative. Curve 3 shows the results with the same carburetor with a standard service setting. The curves in Fig. 5 serve as a comparison between carburetor "A," and two sizes of carburetor "B," on another car. Fig. 6 shows the remarkable economy obtained with carburetor "A" on a light touring car.

### Gear Ratio

There is one method of increasing the economy that is not wholly obvious, and hence has been given little consideration, which deserves attention from engineers. Presented as a general proposition, the smaller the gear ratio the better the economy. This can be proven by means of formula 3 and Fig. 1. Assuming a given size car and a given engine performance, the  $P_s$  necessary to drive the car at speed  $S$  will vary inversely as the gear ratio.

$$P_s = \frac{3000 HP_s D}{CLB^2 SG}$$

As the horsepower necessary to drive the car at speed  $S$  is independent of the gear ratio, this may be written

$$P_s = K_2 \frac{1}{G} \dots \dots \dots (4)$$

where

$$K_2 = \frac{3000 HP_s D}{CLB^2 S}$$

A study of the fuel utilization plot (Fig. 1) shows that the minimum brake specific fuel consumption decreases as the brake mean effective pressure increases. Hence at any speed as the gear ratio decreases,  $P_s$  increases and  $f_m$  decreases. The marked influence of gear ratio is conclusively shown by the curves in Fig. 7. Curve 1 is the optimum economy obtained with a gear ratio of 3.5 to 1; curve 2 with a normal gear ratio of 4.92 to 1; and curve 3 with a gear ratio of 6 to 1.

This increase in economy is always obtained at the expense of acceleration ability and may result in either an increased or decreased maximum speed.

A graphic representation of these facts is shown in Fig. 8. Curve 1 is a plot of engine horsepower against car speed with a gear ratio of 6 to 1; curve 2 is a similar plot for a ratio of 5 to 1; curve 3 for a ratio of 4 to 1; and curve 4 is a plot of the power required to drive the car

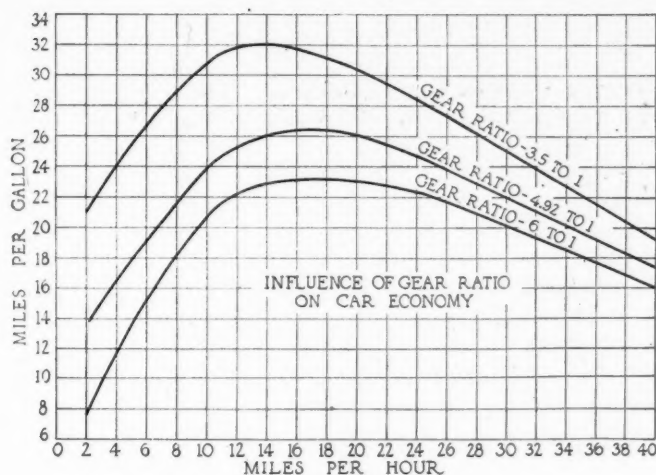


Fig. 7

at various speeds. At any speed the distance between the engine and car power curves is an indication of the power available for acceleration and hill climbing; and their intersection gives the maximum speed. From an inspection of the curves it may be seen that for the largest and smallest gear ratios, the maximum speed is practically the same. For the larger gear ratio the accelerating ability is materially increased at the expense of fuel economy. The intermediate ratio is a compromise as regards accelerating ability and fuel economy, and results in an increased maximum speed.

The fuel situation demands that every effort be made to

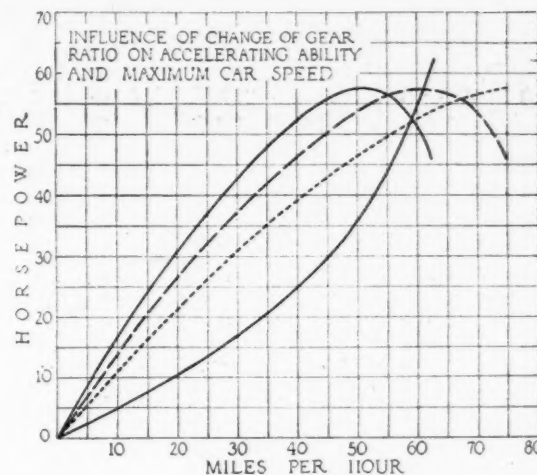


Fig. 8

conserve fuel, consequently, a smaller top gear ratio should be used in the average car, and the public educated to the more frequent use of the gear shift. This presents the problem to the engineers of making the most conveniently operated gear shift. Tests made on a Cadillac car equipped with a two-speed rear axle serve as an example. A 20 per cent increase in miles per gallon was obtained when using the smaller gear ratio.

The high mileage obtained with European cars is not due to superior engine design, but to the use of smaller gear ratios in the final drive. Such gear ratios involve less rapid acceleration.

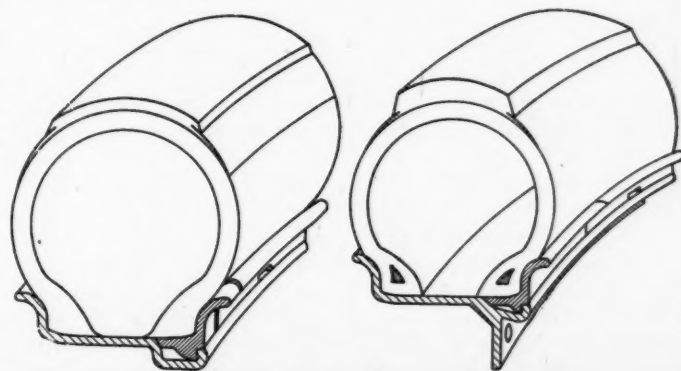
## A New Design of Wheel Rim

A WIRE wheel rim and a demountable rim have been developed by the Johnson Rim & Parts Co. Referring to the illustration of the wire wheel rim, the base is made of hot rolled mill section, low carbon, deep-drawing stock, in which there is said to be very little cracking or distortion in cupping or punching. This type of rim lends increased strength to the wheel, being so designed that the front and center spokes come at a greater angle than usual. This at the same time makes it possible to secure the wood wheel tread on most cars. The lock ring is made from high carbon, hot rolled mill section, heat treated. It is claimed that, once this ring is placed on the rim with the tire mounted, there is no possibility of it being thrown off, yet the rim is easily assembled and disassembled. All front and center spokes are laced in the outside channel, thereby permitting the use of shallow cupping and shorter spokes. This outside channel reinforces the outside circumferential surface of the wheel. The low channel shoulder is  $9/32$  in. smaller in diameter than the tire base, thus allowing the tire to be readily slipped over it, either on or off. The ring shoulder locks with a 15 deg. grip of the channel shoulder, making it impossible to unlock the ring when the tire is inflated. The pressure of the air in the tire forces the latter against the lock ring itself with an additional locking force of from 70 to 80 lb. per sq. in., which is said to eliminate the danger of the ring being knocked or blown off. A slot,  $1/2$  in. in length and  $1/8$  in. deep, is cut longitudinally in the ring, so that when the tire is not inflated, the ring can be readily removed by inserting a screw driver into the ring slot and giving a slight upward pressure. The ring then easily comes out from under the bead of the tire.

One advantage claimed for this rim is that it protects

the tire and tube, because the bead of the tire does not come in contact with the nipple heads, most of which are covered by the rim ring.

An illustration is shown also of the Johnson demountable rim. This is provided with a steel flange which covers and supports the outer side of the felloe, protecting it from impact with the curb, etc. At the point where the flange joins the rim, the section is a combination of a "T" and a "Y" bar, which is a form of great strength. Bolt holes are punched through the flange at six equi-distant points and, by means of bolts inserted through these holes, the flange and rim are firmly held in place. The flange entirely covers the outer circumference of the wheel, hence it is impossible to get the rim on wrong. When the rim is put on, the weight of the tire and the rim itself cause the rim to fall positively into its proper position, the flange fitting tight up against the felloe.



Johnson wire wheel and demountable rims

# Comparative Tests with a Hot Spot Device

Dynamometer tests made in the engine laboratory of Lewis Institute show an appreciable fuel economy over a wide speed range, smoother low speed, full throttle operation and reduced crankcase dilution with a Losee hot spot device fitted to a six-cylinder engine.

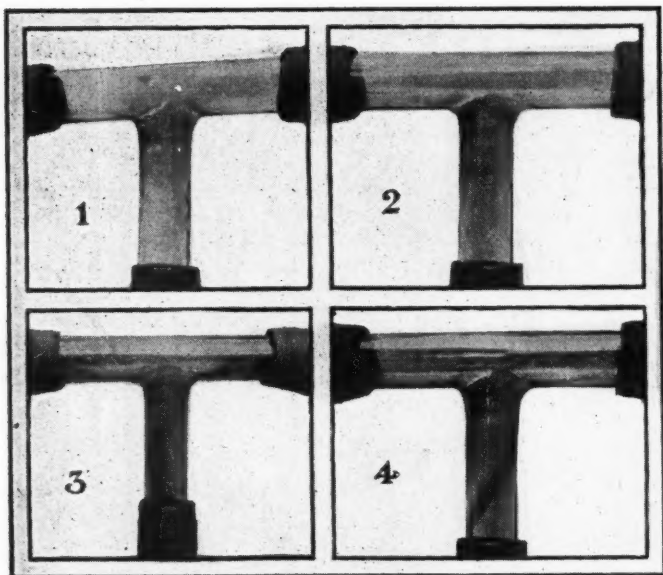
By Roy E. Berg\*

**I**N a report presented by the Society of Automotive Engineers Fuels Committee at the Ottawa Beach meeting last summer the use of the exhaust gas-heated hot spot was recommended as the best known means for dealing with present-day fuels. In order to determine the relative performance of an engine with and without the application of exhaust heat to the mixture, the technical department of Motor Age recently conducted a series of tests on a six-cylinder engine, first with and then without a hot spot of the replacement type.

The tests, which were made in the laboratory of Lewis Institute, Chicago, emphasized the points made at the S. A. E. summer meeting, and among the benefits derived may be noted the following:

- 1.—Crankcase dilution is greatly reduced.
- 2.—More stable operation under load at low speed is secured.

\*Technical Editor, *Motor Age*.



1—Irregularities on the side of the vertical section are rings of fuel slowly creeping up. 2—View taken 36 s. later. Manifold clear of all accumulations of fuel. Engine operating at 500 r.p.m. with heat on hot spot. 3—Heat turned off from hot spot. The fuel was colored red so as to show clearer in the photos. The engine is rapidly accelerating and the spiral motion of the fuel is clearly seen. 4—The spiral emerging from the hot spot is caused by the spirally shaped fins within the aluminum casting. Engine is running at a constant speed

- 3.—Greater fuel economy is obtained between limits.
- 4.—Manifold loading is eliminated.

The engine used was of the overhead valve type having six ( $3\frac{1}{8} \times 4\frac{1}{4}$ -in.) cylinders. It would ordinarily be classified as a high speed type. The engine was fitted with a Stromberg model L-2 carburetor of the plain tube type having a 1-in. connection. The dynamometer employed was of the electric cradle type, the field coils being separately excited. Engine and dynamometer were connected through a short shaft which was fitted with Thermoid-Hardy flexible disk joints. The output of the generator was absorbed in a resistance panel with nichrome wire resistances so divided up that any load from nothing to overload could be applied.

For measuring the fuel consumption, use was made of the syphon device with a few modifications to obviate troubles from the accumulation of bubbles in the fuel line. The syphon principle has been shown to be capable of giving very accurate results in the measurement of fuel, but it is sometimes unreliable on account of air bubbles accumulating in the line. However, when the syphon flow is first passed to a gravity tank and from there to the carburetor, the method becomes very reliable. For the benefit of those who have experienced this kind of trouble, an illustration of the gravity tank arrangement is shown herewith.

Another interesting development resulting from the test was the engine cooling system. In making a dynamometer test road conditions frequently are not as closely approximated as might be desired, but by using an auxiliary cooling system of the type to be described, it becomes possible to duplicate any conditions. Inasmuch as the engine was of the thermo-syphon type, insufficient circulation was provided, and means had to be employed to augment the flow, for the cooling fan was not used.

Two auxiliary systems were provided, one to aid circulation through the engine and the other to increase the cooling capacity of the 60-gal. tank. To increase the circulation an injector was used. This consisted of a small nozzle through which water was forced under high pressure. The nozzle, which was  $\frac{3}{32}$  in. in diameter, was connected to the water inlet of the engine jacket. A small amount of water was introduced by this means and high pressure behind the stream greatly increased the circulation. It was found that, although a good circulation was induced by the injector, the radiation area provided by the tank was insufficient to dissipate the heat.

Therefore, connection from a hydrant was made to the lower end of the tank, and water was drawn off at the

top, where an air vent was also provided. By this means the temperature could be very closely regulated at any desired point; in fact, it was possible to maintain the temperature to within one-half degree.

A spacer was provided between the engine and the carburetor block, which permitted of the insertion of a thermometer in the gas passage. It is realized that, because of the wetness of the mixture, thermometer readings in the intake manifold are not as accurate as they might be; nevertheless, they give a fair idea as to the effect of intake gas temperature on engine operation. The engine revolutions were measured with a speed counter and the operating speed was accurately maintained by two tachometers checking each other.

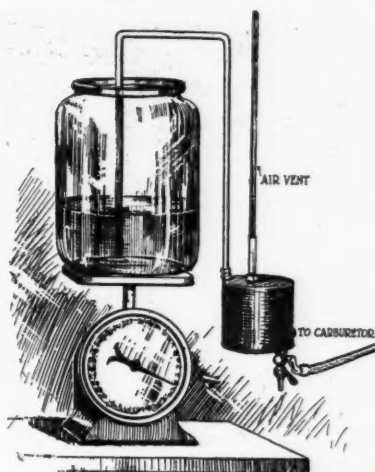
To the output in watts computed from the volt and ampere readings was added the loss in the dynamo. This is composed of two items, namely, the friction loss and the I<sup>2</sup>R loss.

Authorities are agreed that the greatest benefits from a hot spot are derived at low speed, and since this was borne out during the test before 1250 r.p.m. had been reached, the maximum horsepower was not aimed at.

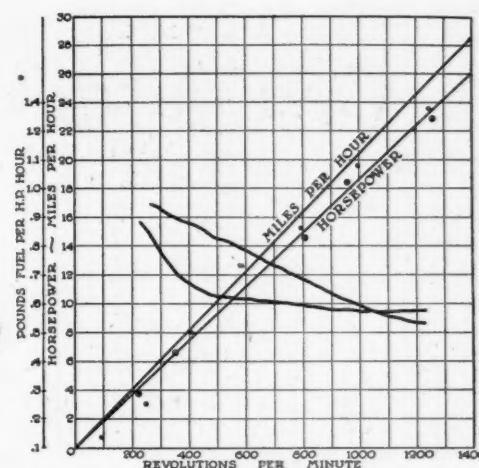
The second part of the test was conducted under average road conditions, to determine the exact benefit from the use of the hot spot with regard to crankcase dilution. A six-cylinder car in fairly good condition was used for the experiment. To afford a visible demonstration of the effects, this car was fitted with a glass manifold, of which a number of photographs were taken.

The first dynamometer test was made without the hot spot, the engine lying in the exact condition as sent out by the manufacturer. The carburetor was adjusted to as lean a mixture as could be burned without causing back-firing. In fact, the mixture was made so lean that the engine backfired constantly on retarded spark and while it was cool, the trouble being overcome only when the engine was warmed up and running on advanced spark.

In specifications of engine tests it is ordinarily stipulated that the duration of the run shall be at least five minutes. For the purpose of greater accuracy the tests on this engine was made to cover 15 minute periods, except runs at higher speed, these being of ten minutes' duration. Table 1 gives the results of the first test run without the hot spot, at 250 r.p.m. Practically three hours were spent in obtaining a satisfactory test at this



Arrangement of fuel weighing apparatus and syphonic feed. Horsepower and fuel consumption curves with and without hot spot



low speed, and the carburetor choke valve had to be closed in order to get the engine to perform at all.

In each case the difference between the two fuel weight readings was taken to give the fuel consumed. This figure, divided by the horsepower produced and multiplied by the time factor, gives the consumption of fuel, in pounds per horsepower hour.

The test with the hot spot was made under the same conditions as without the hot spot. With the hot spot installed on the engine it was found that the same operation could be secured with a leaner mixture at low speed. Much better idling was secured from the engine with the hot spot in place. After the engine had been brought to the proper temperature it was immediately placed under load at wide open throttle, running at 100 r.p.m.

The data obtained, when presented in graphic form, shows very strikingly the benefits of the hot spot. It was anticipated that there would be no increase in horsepower with the hot spot. A falling off in power might be expected, as a result of the expansion of the air and the reduced volumetric efficiency consequent thereto; however, no difference in the horsepower curve was noticed, except that the more stable engine operation with the hot spot made the readings lie closer to the curve. A great difference is shown in the fuel consumption between low speed and 1060 r.p.m. The upper fuel curve gives the data from the test without the hot spot and the lower with. The best results from the hot spot, as far as economy is concerned, were obtained at 450 r.p.m. where the saving amounted to 24 per cent.

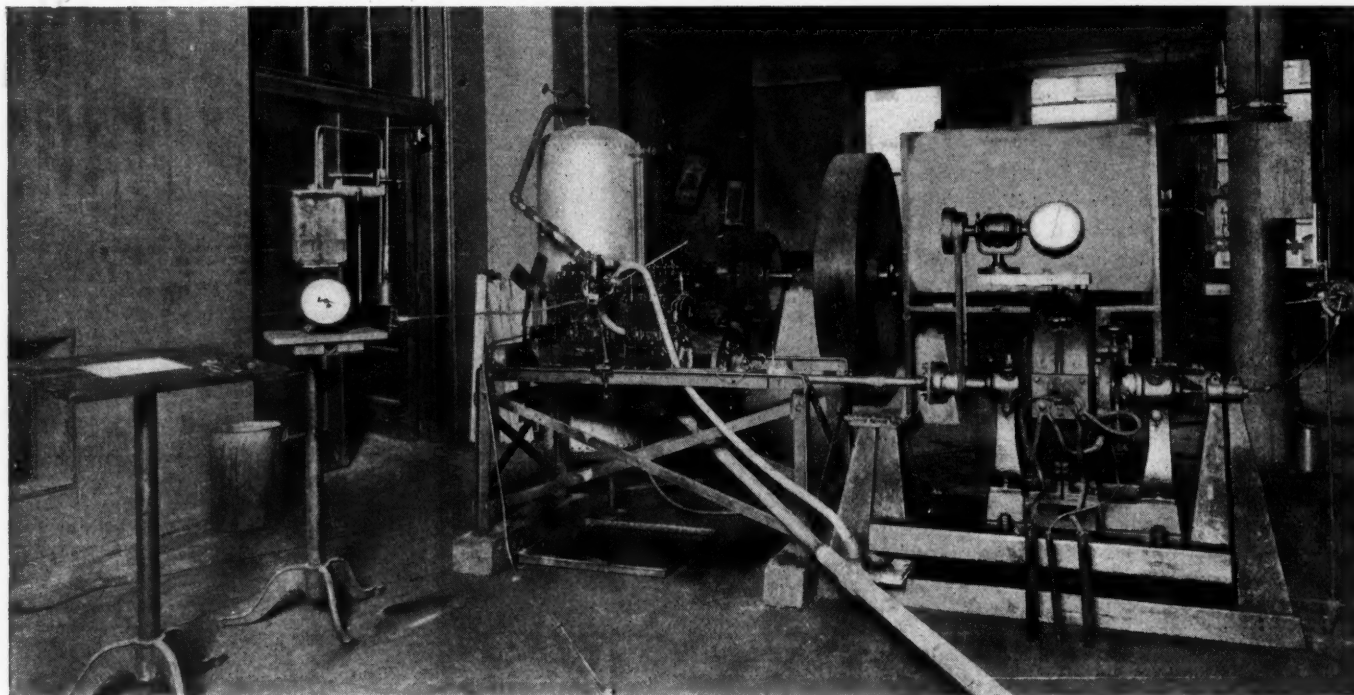
#### TEST WITHOUT HOT SPOT

Test No.	Duration of Run, Min.	R.P.M.	Volts	Amps.	Watts	Loss in Dynamo	Actual Watts	Engine Horsepower	Water outlet Temp.	Intake Gas Temp.	Fuel Consumed	Fuel per Horsepower-Hour, Lb.
L	15	250	37	44	1628	537.5	2165.5	2.9	178	114	.704	0.971*
2	15	409	47	102	4794	1172	5966	7.98	178	125	1.79	0.895
3	15	633	57	107	6109	1627	7736	10.34	182	126	1.96	0.759
4	15	800	78	118	9210	2036.5	11246.5	15.07	180	98	2.61	0.693
5	15	1000	112	110	12310	2343	14663	19.63	182	100	2.97	0.605
6	10	1250	126	111	13960	2813	16773	22.46	185	104	2.125	0.567

#### TEST WITH HOT SPOT

L	20	100	9	25	225	205	430	.577	130	120	.469	2.44
2	15	114	10	37.5	375	267	642	.861	182	148	.2815	1.306
3	15	240	23	89	2047	757	2804	3.761	182	160	.847	0.9
4	15	349	33	105	3465	1089	4654	6.25	182	160	1.1095	0.706
5	20	503	51	107	5460	1398	6858	9.19	184	162	1.496	0.653
6	15	626	65	104	6760	1593	8353	11.20	180	158	1.685	0.602
7	15	806	84	105	8825	1932	10757	14.42	178	144	2.160	0.582
8	15	970	105	108	11350	2267	13617	18.29	180	146	2.74	0.601
9	10	1260	138	103	14214	2764	16978	22.75	182	144	2.22	0.585

\*Hot air valve had to be closed; 250 r.p.m. lowest possible speed.



General set up of test, showing fuel tank on scale, cooling tank, engine and dynamometer

On the basis of a gear ratio of  $4\frac{1}{2}$  to 1 and the use of 32-in. tires, there is a fuel saving as a result of the use of the hot spot up to approximately 25 miles per hour.

In the second test, made on a six-cylinder car, the main object was to determine the effect of the hot spot on crankcase dilution. Many experiments have shown that the oil loses some of its lubricating properties before the car has covered the first 100 miles. Examination of numerous reports by a large oil company show that the lubricating oil in the crankcase after approximately 100 miles running reaches a point of equilibrium, where the inflow of fuel from piston leakage is offset by the evaporation through the breather. From this it was concluded that a two-hour idling test at 500 r.p.m. would give a fair insight into the dilution factor. Accordingly, the engine was supplied with a good grade of Pennsylvania, paraffin base oil and run for two hours at 500 r.p.m. without the hot spot. Then a quart of oil was drawn off, the crankcase drained and flushed and thor-

oughly cleaned. The test was then repeated after fresh oil had been put in and the hot spot applied. The oil was tested by the chemical department of the Sinclair Refining Co., and the report is as follows:

#### ANALYSIS OF CRANKCASE OIL USED IN TEST

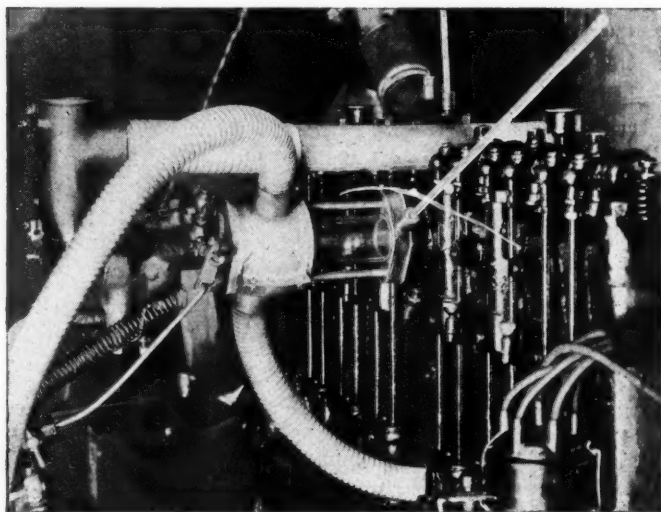
Without Hot Spot	With Hot Spot
Gravity .....	30.3 30.1
Flash .....	265 330
Fire .....	465 460
Pour .....	40 45
Color .....	Cloudy N. P. A. Cloudy N. P. A.
Viscosity	
At 100° F.....	217 256
At 130° F.....	116 131
At 210° F.....	49 51
Conradson	
Carbon .....	.29% .22%
Emulsion .....	Poor Poor
Acid Value .....	.28 .18
Ash .....	Trace Trace
Sed. by wgt. ....	Trace Trace
Sed. by vol. ....	Trace Trace
Dilution at 600° F.....	5% 4%

#### ANALYSIS OF FUEL USED

Gravity .....	56.4	Initial .....	108.
Color .....	Plus 23	At 221° .....	24.0
Doctor		At 284° .....	50.0
With Sulphur N. G.		At 374° .....	85.0
Odor .....	N. G.	End .....	430
Heat ....	31 degrees	Loss .....	2.0%

The analysis of the gasoline shows sample fairly representative of the gasoline now being marketed.

Some very satisfactory results were obtained from the glass manifold, which was made up by the Corning Glass Works specially for this test. A number of photographs were taken, which showed the effect of heat application to the mixture. Without the heat applied to the hot spot, the manifold was very prone to "load." Heavy puddles of fuel were noted at the inside turns of all bends. The

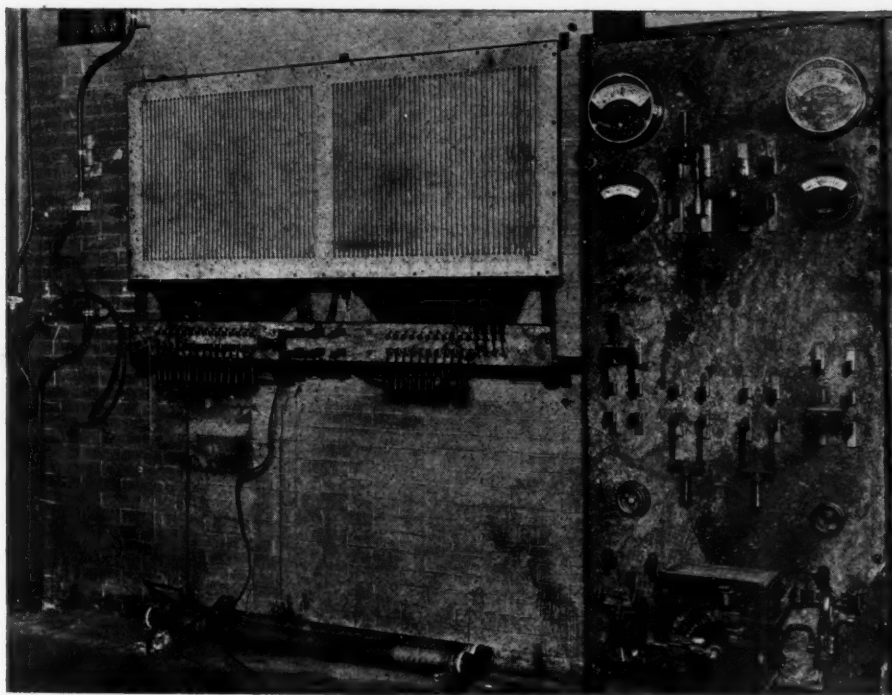


View showing carbureter, hot spot, glass manifold and flanged insert for holding thermometer

walls of the riser of the T were covered with raw fuel, which traveled slowly upward until the T section was reached. Here the puddles would increase in size and a moment later a large portion of the puddle would break away from the mass and, becoming free, would enter the engine.

These were the moments when faltering of the engine was noticed, and the entrance of this unvaporized fuel is probably the reason for the spasmodic operation during "loading." When the heat was applied to the hot spot this tendency to "load" was immediately reduced. In 36 seconds time after the heat was turned on the manifold was practically dry and the only noticeable factor that would lead one to believe that any fuel at all was passing through was a slight film that seemed to be creeping along the surface of the glass. No puddles or accumulations were present. This seems to substantiate the assertion that proper manifold design is even a larger factor in achieving fuel economy than is a volumetrically correctly proportioned mixture.

The hot spot itself is of aluminum, having a pressed steel housing surrounding it, through which the exhaust gases are caused to surge. The internal passage for the mixture is so made that there is no wire drawing at any place. The gases are intercepted by the spiral vanes inside the hot spot, which give a whirling motion to the mixture, as well illustrated by the photograph which



*Resistance board and control panel which serve to absorb and control the electrical energy produced*

shows a streak of mixture emerging from the hot spot.

The gases in the exhaust manifold can be regulated to take either of two passages with the hook-up from this hot spot. Either the entire volume of exhaust gas can pass through the hot spot or the hot spot passage can be closed, in which event the gases will pass directly out of the exhaust manifold.

## Motor Boat Equipment for a Seaplane

THE question has arisen many times during the past year or two as to the status of seaplanes or flying boats. Since these craft must run upon the surface of the water a considerable part of the time, some of the officials of the Bureau of Navigation have raised the question as to the necessity of equipping seaplanes with the articles required by law for motor boats of the smaller classes, says *Motor Boat*.

Recently a supervising inspector of the Steamboat Inspection Service, Bureau of Navigation, stationed at Louisville, Ky., ruled that seaplanes must carry the equipment required on motor boats. This would mean that a seaplane must carry the proper lights, a bell, a whistle, life preservers sufficient to sustain afloat all on board, a fire extinguisher and two copies of the Pilot Rules. As a matter of fact this equipment would place no hardship upon the seaplane, for the life preservers might be in the shape of life preserver cushions for the seats, the bell could be installed without difficulty, and as to the lights, ultimately all aircraft must carry lights following very closely marine practice. The copies of the Pilot Rules, while not essential perhaps, contain the rules of the roads and other regulations which must be followed by any seaplane while running on the surface of the water. It is obvious, however, that the whistle would be of little use. While other craft might hear the whistle of a seaplane, it is certain that the navigator of a seaplane would not be able to hear sound signals from other vessels.

In order to obtain an official opinion on the subject *Motor Boat* asked Commissioner of Navigation E. T. Chamberlain of Washington for an opinion, which is ex-

pressed in the following letter from Mr. Chamberlain:

"I have received your letter of the 25th instant inclosing a clipping from the Louisville (Ky.) *Times* of Aug. 18 in connection with the question whether seaplanes which operate upon the surface of the water a considerable part of the time should be considered motor boats while so navigating.

"The question is one which has troubled the Bureau for some time. The Solicitor of this department has held that such seaplanes are motor boats within the meaning of the law and are required to have the equipment provided by the Act of June 9, 1910. While the Bureau has not questioned that decision, it has not pressed the matter, as undoubtedly these planes are primarily intended for air rather than water navigation, and there is considerable doubt as to the carrying of the equipment adding to the safety of those on board. Of course, while these planes are in the water they should comply with the rules of the road, with the possible exceptions of passing signals, which for obvious reasons could not be heard.

"I think you will appreciate the difficulties of the case. I have endeavored to bring the matter to a court decision but so far without success."

Respectfully, E. T. CHAMBERLAIN, Commissioner.

It is apparent that the problem is one which has troubled the Bureau for some time and also that the Solicitor of the Bureau holds that seaplanes are motor boats. Evidently the Bureau of Navigation is trying to get the matter settled definitely and satisfactorily by bringing it to a court decision but has been unsuccessful in obtaining this.

# Sales School Develops Permanent Business Builders

Since effective merchandising methods have become of vital importance, special interest attaches to the development of good salesmen. Training courses for salesmen are being given in some places to fill this need. A course which trains a few high-grade men intensively is described here.

By Norman G. Shidle

**T**HE idea is becoming common among manufacturers that their salesmen can render the most effective service only if they understand the spirit and ideals of the company for which they work as well as the technical details of the product which they are marketing. Such men have a broad vision of their task and an intelligent conception of really effective business building. They are likely to do more for the firm than sell cars; they carry on their selling activities in such a way as to build permanent business and increasing goodwill for the organization. And they often form a fertile field from which to draw future executives.

It is this conception of permanent business building that has been responsible to a large extent for the establishment of sales training courses by a number of manufacturers. Since the widespread application of the training idea is comparatively recent, few standards of practice have yet been developed. The courses vary widely in method and some have been more successful than others. It was suggested to AUTOMOTIVE INDUSTRIES some time ago that an association be formed of those firms conducting sales schools, similar in form to the National Association of Corporation Schools, but less extensive in scope; the purpose of the organization to be the exchange of experiences, the determination of the best methods of conducting such courses, and the general promotion of more effective use of the sales school idea.

Whether or not such a plan would be feasible, it is certain the knowledge of the practice in other organizations is likely to be of value in conducting a course in any particular instance. For this reason the details of several successful training courses for salesmen will be presented in AUTOMOTIVE INDUSTRIES. Much valuable information can thus be brought out concerning general methods of procedure as well as concerning specific practices which might profitably be adapted elsewhere. The present article deals with the course conducted by the Nordyke & Marmon company for their automobile salesmen.

## Small Number of Carefully Selected Men Trained

The chief characteristics of this particular course may be listed as follows:

1. It trains a small number of men.
2. These men are very carefully selected and in practically every case have exceptional qualifications to begin with, both as to education and personality.
3. The training is very thorough, covering a period of six months' intensive work.

Such a course prepares the ground work for a strong organization in the future and produces each year a few

strong men for immediate work. It does not provide a large number of men for immediate service in the field. It looks rather toward obtaining the proper men in the beginning and training them for permanent service with the company.

One class begins every six months, usually in April and September. Each class comprises five members. The selection of the men is very carefully made. Previous employment with the Marmon organization is not a requirement, but men in the dealer or distributor organization may take the training provided they are selected. No definite set of requirements has been written out, but certain qualities are always required. The past history of the applicant is carefully investigated. He must have a pleasant personality and all of the other qualifications which are necessary to any salesman. In addition he must have an excellent education. Thus far nearly every man to be admitted to the course has been a college graduate, and although a college education has not been made a strict requirement, a man needs an equivalent preparation to fully meet the demands of the training.

## Actual Shop Work Performed by Students

When the men have been chosen they come to the Marmon factory, where the entire course of training is conducted. Thorough instruction is given along four main lines:

- |                         |                  |
|-------------------------|------------------|
| 1. The product.         | 3. The buyer.    |
| 2. Selling the product. | 4. The salesman. |

A large part of the time is spent in becoming thoroughly familiar with the product. This is accomplished by actual shop work on the part of the student. Each student goes into the shop and works as an ordinary member of the operating force. He remains in each department until he is capable of performing the work of that unit satisfactorily.

He works for a time in each of the sub-assembly departments and before he is through must be able to make each of the sub-assemblies. Later he is moved to the final motor assembly department and works there until he can perform the various operations efficiently. He spends some time as well in the heat-treating and motor-testing departments and learns the details of their operation.

A reading and recitation course on gas-engine design is given which must be passed by each of the students. Another lecture course takes up the theory of salesmanship.

This theoretical knowledge of selling, which is pre-

sented in an abstract way, is supplemented by practical experience in selling. These students are sent out to automobile shows and there gain concrete experience in meeting customers and attempting to sell cars. They were used recently with excellent results both to students and dealers in the National Demonstration Week held during October.

The mechanical phases of the product covered by the student may be summed up briefly as follows:

- |                       |                           |
|-----------------------|---------------------------|
| 1. Design.            | C. Frame.                 |
| A. Powerplant.        | D. Body.                  |
| a. Engine.            | a. Interior.              |
| b. Electrical system. | b. Exterior.              |
| c. Carburetion.       | 2. Construction.          |
| d. Cooling system.    | A. Manufacturing methods. |
| e. Lubrication.       | B. Inspection.            |
| B. Running gear.      | 3. Operation.             |
| a. Transmission.      | A. Performance.           |
| b. Rear system.       | B. Upkeep.                |
| c. Front system.      |                           |

A nominal salary of \$100 a month is paid to the students while they are taking the course. If a man completes the course successfully, however, a good position is awaiting him.

A general outline of the course shows that many features of the product are discussed besides the mechanical phases. Among the esthetic features of the product discussed are riding qualities, interior finish, exterior finish, body lines, social position in automobile society.

#### All Details of the Organization Are Discussed

The policies of the company, its ideals, its methods and its history are all fully discussed. They learn concerning the company, its age, financial rating, size as regards both employees, buildings and equipment, organization and reputation. This gives them a thorough knowledge of all departments of the business, broadens their vision and makes them potential executive material. Throughout the course the students have the opportunity for personal contact with the executives of the company, and in this way become familiar with the actual practice and methods used in the organization. And in like manner, the executives get an opportunity to know these new men, to estimate their ability and possibilities with the company.

A thorough drilling in all phases of sales work is given. In the outline for instruction in this connection appear the following subjects:

- |                              |                                      |
|------------------------------|--------------------------------------|
| 1. Advertising.              | B. Handling objections.              |
| A. Policy.                   | a. Feigned.                          |
| B. Relation to selling.      | b. Real.                             |
| C. Purpose.                  | 5. Satisfying reason.                |
| D. Mediums.                  | A. Closing the sale.                 |
| E. Psychology.               | a. Signing the contract.             |
| 2. Developing prospect list. | B. Buying motives.                   |
| A. Primary list.             | a. Sales arguments.                  |
| B. Secondary list.           | b. Selling strategy.                 |
| 3. Setting interviews.       | 6. Selling service.                  |
| A. Home.                     | A. Buying used cars.                 |
| B. Office.                   | B. Creating good will.               |
| C. Clubs.                    | a. Making a booster.                 |
| 4. Creating desire.          | b. Beginning to sell the second car. |
| A. Developing interest.      |                                      |
| a. The demonstration.        |                                      |

The student is taught in a sensible and general way how to analyze the prospective purchaser to whom he is selling a car. He is taught to consider both the financial and social status of his prospect, together with the latter's taste or attitude of mind. Some men are discriminating, some mechanical, some beauty lovers, etc. The student is shown the best way to sell to each of the various types.

That the student may analyze himself sufficiently to know whether he comes up to the standards set for being a good salesman, the various desirable qualities of such a salesman are discussed. Under this head the following qualities come in for attention:

1. Instinctive fitness.
2. Scientific training.
3. Care of health.
4. Appearance; cleanliness and dress.
5. Deportment; courtesy, tact, adaptability, optimism.
6. Initiative.
7. Persistence.
8. Honesty.
9. Knowledge of car.
10. Knowledge of psychology.
11. Conversational power.
12. Good manners.
13. Salesroom ethics.
14. Knowledge of outside factors which affect car sales.
  - a. Current and future business conditions.
  - b. Stock exchange.
  - c. Commercial reports.
  - d. Society doings.
  - e. Inheritances.

From this outline it is apparent that a very wide knowledge of current events, as well as of selling principles, is necessary for the man who is to attain a high place in the selling field. Through such a course as has been described, the new salesman is made aware of all the things he should know and is actually taught a great many of them. And not the least among the things gained from the course is a conception of the spirit of the organization; its tradition, its history, its organization, and its ideals. If these things can be imbued into the new man, he will be able to do the most effective work possible for the company. How effective that work will actually be is dependent, of course, entirely upon the essential goodness of the tradition, organizations, and ideals which the company has to imbue him with. In some cases these are very good; such companies are capable of turning out good salesmen—and good men. In other instances, this is not possible. The success of any such training course and of the men turned out by it will always depend largely upon the fundamentals of the organization which is conducting the course.

## An Aid to Battery Service

**B**ATTERY Service Manual by Donald D. Blanchard; U. P. C. Book Co., New York. The satisfactory operation of the automobile depends to such a considerable extent on the condition of the storage battery that the provision of service facilities for it has become a matter of prime importance. In this book, which is a reprint of a series of articles that appeared last spring in *Motor World*, the battery service problem is treated in simple, non-technical language exclusively from the practical standpoint.

The text matter is based primarily on information secured during visits to a large number of service stations. The methods described are in current use. Consequently this manual is of unusual practical value.

The Storage Battery Trouble Chart, reprinted for wall mounting, is furnished as a supplement to the book. The first chapter deals with battery troubles and following this come chapters on the test for and location of these troubles. The subject of battery charging is then discussed. Battery repairs are taken up next and general methods and the use of tools and special equipment are discussed. The next chapter is on service station layout and the final section treats of management.

# Selling Spare Parts with Export Cars

Much to our surprise we learned the other day that some exporters are sending initial orders of cars to foreign countries without spare parts. Could anything be more disastrous? This article describes an incident and quotes a few opinions of a Finnish importer on the subject.

By Clyde Jennings

**E**XPORT trade in manufactured articles is a comparatively new development in this country, and especially is it a new line of thought and activity for a good many of the automotive manufacturers. Some of the old world countries have exported automotive vehicles for a number of years, but their experience is not of great value to American firms, because of differences in unit products and because of the number of units involved in plans.

The American manufacturer will not be interested in export trade unless he can sell in greater numbers than has the European manufacturer. The American manufacture (and consequently the sales methods) is built on the quantity idea. The American is looking to the export territory with a view of possible consumption, under the proper encouragement, not with a view of how many cars he can ship on immediate orders. The American naturally compares the population of the foreign country with that of this country and he will not be entirely content until the automobile population is at a comparable percentage. Of course this will take time and a long educative campaign, but it well illustrates the point of view.

All of this is said to bring up a point that is entirely different. It is this:

While rushing into this great, but little understood, field of trade the American export trader has been, is, and will be for several years to come, a victim of many easy money seekers. Practically every automotive manufacturer has met men who are ready, for the proper consideration, to "put him right into the export business." The list of manufacturers who have paid these men real money would be a long one. It would not be so bad if the loss to the manufacturer was all there was to this experience, but the great loss to the prestige of the American automobile in general and certain automobiles in particular is far greater and of much more importance.

After bumping into several disastrous experiences of this kind a number of automotive manufacturers have established export agencies, or have signed long sales contracts with established export houses, which have automotive experience and which promise only a gradual development.

## Still a Danger

But even at this stage the danger from the "easy money" adventurer is not past. He is still at large and is reaping a rich reward for his supposed knowledge and piling a heavy overhead on an industry that cannot afford it, when we consider the world-wide competition that it must meet, also that it is an "infant industry" as far as export trade is concerned.

Now we are getting to the real point of this article.

Recently there came into our office a man who wanted to sell to us certain ideas on export trade. The chief idea was printed in a book that cost, he said, in the neighborhood of \$50,000, and we do not doubt his word.

The book was a parts list, with the proper inventory of parts set forth for a dealer in Pernambuco who might have 1, 2, 4, 5, 25, 50, 75, 100, 125 and 150 cars in service. This was beautifully printed and was an intricate bit of printers' work. It looked more like a railroad tariff sheet than anything else we can think of. The idea was excellent, it was well carried out except that we think there was an immense unnecessary labor in filling so many columns.

This company sells abroad several models of cars and trucks, so this was quite a large book, of necessity. The first bad feature of it was that about 18 pages of text were taken for the introduction, and it is necessary to read all of the introduction to understand the arrangement in the columns. Often a single word or figure at the head of the column would have made it perfectly plain, but this was omitted. Apparently this was done to make use for the introduction. The compiler appeared to think it was quite necessary to have the introduction acquire importance.

But the amazing part of this book was a cable code that occupied a number of pages. As the compiler explained, this was arranged so that the dealer in Pernambuco could order the parts for 125 cars with the use of a five letter word.

## Cars Without Parts

Here is where a difference of opinion arose that in turn ended the interview. The following dialogue will explain:

Question—Do you mean to say seriously that this company will sell to a dealer in Pernambuco, or any other place, 125 cars and not require him to buy a stock of parts?

Answer—Why, certainly. All exporters do business that way.

Question—What happens as to parts when a dealer orders 125 cars?

Answer—The service or parts department is told that this man is a prospect for the purchase of parts on this list.

Question—Do you mean to tell me that any dealer ever ordered cars from this company and later cabled for a full list of parts?

Answer—Why, certainly. Such orders are coming in almost every day.

Question—Now, honestly, man to man, do you really mean to tell me that this company will sell a large number of cars to go to a dealer thousands of miles away from the factory and not exact an order for parts?

**Answer—Why, certainly, I am honest in telling you that. They could not sell cars if they insisted on the parts.**

Then he named five automotive export companies that he said followed this custom. As to four of them, the writer had no knowledge; but the fifth, he knew it would not sell a dealer cars without a parts order attached, and he said so. So the visitor said he was not certain as to that company. Then we closed the conversation.

As testing this statement that all exporters did business in this way, we called up an old-time exporting house that has been quite successful in selling a complete line of cars and trucks in many parts of the world. This company has a parts list similar to this \$50,000 one as to information, only it did not cost anything like that amount. It is made on a typewriter, mimeographed, and can be changed overnight, if required. It is kept up to date without printers' bills and is so cheap that it can be placed in hands of every one concerned without raising the overhead. This firm was asked if a parts order was required with an order for vehicles. The answer is interesting in itself. It is like this:

**"We do not exactly require a parts order with the order for vehicles. A good many foreign business men do not like to be required to do anything. We handle this question as diplomatically as possible, but it has been a long time since we exported an initial order of vehicles without the proper number of parts going with them."**

The firm mentioned by the \$50,000 book man to which we objected has a positive policy. This firm does not sell abroad except to dealers. It does not accept as a dealer any business man or firm that is not willing to undertake the service end of the business and to order the proper number of parts. In fact, the parts order is automatically attached to any order for vehicles.

This whole proposition seems so very primary to the writer that he was very hard to convince that any firm would even consider an export order without providing for parts and service, but it appears that some companies do this very thing and then lose heavily by reputation because they follow this practice. There certainly is no one thing that will as quickly destroy the prospect of selling a car in a foreign country as getting a lot of cars into that country and then not having them run.

Any dealer in this country will tell you that it is impossible to take 125 cars of any make and expect them all to go into service and stay in service even a limited time without service and parts.

There have been some curious efforts at export trade. Recently a letter came into this office from a truck manufacturer that read something like this:

**"We are not much interested in export now. Some time back we did sell some trucks for export, but at present we are unable to find the record of to whom these trucks were sold, or to what country they were shipped."**

As to this attitude, we can only hope that these trucks will not be "ghosts" for this company if it ever decides to go into exporting.

#### An Importer Speaks

We want you to read just a bit farther. This letter, received since this article was written, would appear to entirely sustain the position taken here:

J. E. Tuokkola, a dealer in American automotive goods at Helsinki, Finland, is the writer. From this letter we gather that Tuokkola is quite satisfied with the treat-

# 4

" " TRUCKS

ITEMS	SYMBOL	NAME	1 CAR	5 CARS	10 CARS	15 CARS
105	1FW4	Tire holder strap		1	2	2
106	2RE281	Assembled windshield		1	2	2
107	1TF36	Radiator cap	1	3	4	5
108	R1RG116	Assembled lighting switch		1	2	2
109	1RG64	Key for lighting switch	1	3	5	8
110	3TG29	Assembled headlamp		1	2	3
111	3TG28	Assembled tail lamp		2	4	6
112	1RG13	Assembled ignition switch		1	2	3
113	1RG13A	Key for ignition switch	1	3	5	8
114	1FH7	Filler plug for gas tank		2	4	6
115	T1TJ1	Assembled starting crank	1	2	4	6
116	1RK15	Bushing for steering gear bracket		1	3	5
117	1MK3	Bushing for steering gear bracket		1	3	5
118	1FK9	Steering connecting rod		1	2	3
119	1FM10	Brake cable		1	2	3
120	X969	Assembled tool kit 1/8" straight nipple oiler		1	3	5
121	T122	Wrench center crank bearing	6	15	20	25
122	T103	Wrench crank end connect- ing rod	1	1	2	2
123	T101	Piston ring clamp	1	1	2	2

Itemized prices are purposely avoided because of fluctuation. Invoice will afford correct itemization and price lists will be furnished to dealers upon application.

*A page of an easily made and effective export parts list*

ment that he receives from the manufacturers he represents, but that he believes that he is having unfair competition from representatives of rival manufacturers.

**He believes that this unfair competition is due to the fact that manufacturers have not been careful in the selection of their representatives and that the practices he objects to are not those of good business.**

We will quote a few sentences from his letter, which are quite to the point:

**"Your papers are strong enough to do us a material service. American manufacturers are, of course, looking for more business, which is well. But they should look longer into the future by being more careful as to the firms they select as their foreign representatives. Too many manufacturers are giving their lines into the hands of firms that cannot properly represent them. It merely means that the manufacturer is too anxious to sell a large number of cars. He does not look to future sales, when he does not look well into the service. Cars are coming here without spare parts. The knocked down parts are poorly assembled and the buyer becomes disgusted and gives to all American cars a "bad name." It ought to be forbidden to sell any cars to a foreign country without, at the same time, sending a sufficient quantity of spare parts. We must frankly state that European cars have to-day a better name here than American cars, chiefly because the American cars have not been handled properly.**

**"We might add that all American cars are not suitable for Finland. Our roads are rough and hilly and cars to be sold here must be built for these conditions."**

**A** SERIES of lectures on Internal Combustion Engines and Tractors by Oliver B. Zimmerman of the engineering staff of International Harvester Co. has been reprinted in pamphlet form. It constitutes an elementary textbook on farm tractors and is exceptionally well written. The book covers the development, design, construction, function and maintenance and should be a very helpful guide to any one wishing to acquire a knowledge of the fundamentals of tractor construction, operation and maintenance. There are numerous illustrations accompanying the text.

# Austrian Industry Slowly Gaining in Production

Factories were greatly developed during the war and are in position to produce large numbers of vehicles when fuel is available. Three plants now producing and some cars have been exported. One factory plans for 25,000 cars a year. Used cars brought high prices at sale.

By Benno R. Dierfeld\*

**I**N spite of the constantly increasing difficulties, considerable activity is already being developed in the different Austrian automobile factories, the output of which was increased materially during the war. As the demands of the Army were similar in many respects to those of peace time, the increased production has been maintained since the war came to an end. All of the factories are overwhelmed with orders and new vehicles are in great demand, despite the fact that deliveries can be made only after long intervals—that is, of course, only where domestic purchasers are concerned.

All price quotations are only of momentary value, and orders are received without the price being fixed, the purchaser engaging himself to pay any reasonable price the factory demands at the time of delivery. For instance, in July, 1920, the price of a new 20 hp. passenger car chassis was about 210,000 crowns (\$1200 at the current exchange rate of the crown). The pre-war value of a crown was 20c., but at the present time the prices are considerably higher. As the exchange value of the dollar has since risen, this increase in price is of little consequence to the American or English purchaser.

A regular clearance sale of used cars took place in Vienna some time ago, at which seemingly fabulous prices were obtained—from 300,000 crowns for a light car up to 1,500,000 crowns for a luxurious Rolls-Royce 1914 model. (One dollar was equal to 200 crowns at that time.)

The buyers were either Italians or members of the Entente commissions. In this way, of course, a great many good cars were withdrawn from service in Vienna, but this was not at all regretted by the Austrian automobile industry, for a new opening for their product was thus created. Moreover, with the existing shortage of fuel, a lessening of the number of cars in service is not entirely detrimental.

Some information on the activities of individual automobile factories in Austria may be of interest. The plant of the Austro-Fiat Co. at Vienna-Florisdorf (now more intimately associated with the principal factory at Turin than before the war) has been considerably enlarged and now is devoting itself to a more extensive line than previous to the war. The only car on which deliveries are now being made is a 38 hp. passenger car with generator lighting and cantilever rear springs, but a smaller machine with a 24 hp. rating will be brought out in the near future. These models embody the well known features of the Italian Fiat.

A 4-ton chain driven truck (a former military subsidy type) is also produced, as is a light truck of 2-ton capacity.

The line further includes the Excelsior motor plow, stationary internal combustion engine, engines for motor ships and the well known Hiero airplane engine.

The Puch works at Graz, Styria, are building only a large passenger car of 38 hp. rating, which is the same model as turned out in 1914 and during the war. This car is called the Alpine type, because in 1914 it won the first prize in the Alpine Endurance Contest. In its general appearance it is similar to the standard German cars, having V type radiator, a streamline body with horizontal top edge, disappearing top, and a two colored body finish. A smaller model will soon be added. Another product of the Puch works consists of narrow gage railways, with internal combustion engine locomotives. These railways were first built for Army purposes, but are now extensively used in agriculture, forestry and mines, owing to the lack of horses and other draught animals.

The Austro-Daimler works at Vienna, which during the war produced the well known Austro-Daimler aircraft engine, motor cars of all kinds and heavy gas tractors, are chiefly occupied in transforming these war vehicles to render them suitable for peace-time purposes. A 30 hp. passenger car, known as the Alpine type, is also being manufactured, and already has been turned out in great numbers for shipment to foreign countries. A 6-cylinder passenger car is being developed for regular production in 1921. Negotiations for the amalgamation of the works of the Austro-Fiat, Puch and Austro-Daimler were begun last spring, but so far have not led to any definite results.

A newcomer in the Austrian automobile industry is the large Oesterreichische Waffenfabriksgesellschaft (Austrian Arms Mfg. Co.) at Steyr, favorably known because of its production of the Männlicher carbines, Schwarzlose machine guns, etc. This firm, with its personnel of high-class mechanics and its extensive experience in the technique of metal work is preparing to become a sort of Austrian F. N. At present it produces a 6-cylinder, 30 hp. with cylinder dimensions of 80 x 110 mm. Among the features of these vehicles are a ball bearing crankshaft, disk clutch and centrally mounted change speed lever. Both sets of brakes operate on the rear wheels. Half elliptic springs are fitted in the front.

Another model that will soon be put in production is a light-two-seater car with 18 hp. four-cylinder engine of 75 mm. bore and 100 mm. stroke. A truck with 6-cylinder engine and worm drive is being produced. A production of 25,000 cars per year is figured on, but the materialization of these plans will depend upon the ability to obtain sufficient coal.

At present negotiations are pending looking toward the leasing of the works to a British syndicate.

\*Automobile authority and writer of Berlin.

# The Automobile Should Be Major Factor in Highway Traffic

This article, based on recent count of actual traffic in Manhattan, is a plea that legislation be directed toward making traffic safe for the vehicle, not the vehicle safe for other traffic. The automobile has become such a factor that it cannot merely be relegated; constructive effort is necessary.

SOME day, so say those who have made a study of the transportation problems of the country, the highway system will be not at all like that we have to-day; neither will the rules and regulations governing the operation of motor vehicles be those which municipalities and States, from time to time, put upon the statute books.

When the inventor and engineer gave the motor car to civilization, they presented a piece of machinery of which the primary service was speed—a small unit of rapid travel from place to place. Since the coming of the motor car, business and the life of the nation have been greatly speeded up, and the possibilities in this direction are beyond conception, provided the country fits itself to accommodate the product of the inventor and engineer.

Speed is inherent in the motor vehicle, as is realized by any one who has ever driven one. It is difficult to operate a motor vehicle at a slow speed. One may drive for a while at 15 or 18 miles an hour, but almost unconsciously the foot presses down a bit on the throttle and the vehicle seems to travel most conveniently at 25 or 30 miles an hour.

Twenty-five or thirty miles an hour is a perfectly safe speed so far as the vehicle is concerned but it is not safe for the other occupants of the street in cities where the congestion is great. Because of the fatalities and damage done by the rapidity of movement of motor vehicles, the present effort of lawmakers is to lessen the speed of the automobile and motor truck. An analysis of the proposition, however, reveals that the proper plan of attack would be to make the city safe for the vehicle, rather than to work solely to make the vehicle safe for the city.

When a high-speed machine of large productivity is put in operation in a factory, the management makes an effort to get the highest possible speed and the greatest production out of the machine. Methods of a similar nature should be applied to the operation of motor vehicles. Instead of endeavoring to decrease the speed of this modern piece of machinery, the effort of the nation, and its component parts, should be to provide means whereby motor vehicles may travel at somewhere near their maximum safe speed.

Despite the restrictions put upon the operations by legislatures and conditions of the present day, it is interesting to note, nevertheless, the extent to which the use of vehicles is increasing, particularly in the large metropolitan district surrounding New York. Statistics recently have been gathered by the National Automobile Chamber of Commerce, and various bureaus of the City of New York, showing the vehicular transportation between Manhattan Island and the outlying territories.

It is interesting to note that between May 30 and Sept. 15 of the present year the average daily passenger transportation of the Long Island Railroad into New York in the morning and out again in the evening totalled 275,936

passengers. If these people were carried in five-passenger motor cars, loaded to capacity, they could have been transported in 54,187 automobiles. More than half this number of automobiles passes between Long Island and Manhattan Island daily, over the Manhattan and Queensboro bridges, which are only two of the many bridges connecting Manhattan Island with its suburban districts.

A count by the National Automobile Chamber of Commerce made recently showed that 155,700 cars and trucks travel between Manhattan and the suburbs every day, and this despite the very bad conditions which prevail, so far as motor-car operation is concerned.

Driving a motor vehicle in lower New York City, below Forty-second Street, is not a pleasure in any way because of the congested condition of the streets, the slow speed necessary, the many traffic hold-ups.

Those who have studied the situation have predicted that some day there will be overhead thoroughfares, going up and down town in Manhattan Island, also going crosstown at various places, on which vehicular traffic could move at good speed without endangering pedestrians.

It is a subject for mirth to-day when one narrates the early efforts of authorities to make the locomotive safe for the streets. Men with bells were even compelled to run ahead of trains to warn the public. But is that situation much different from that which prevails to-day, when authorities concern themselves mostly with speed reductions rather than means for making speed safe?

Had the original idea concerning the locomotive prevailed it would not be possible to-day to travel from New York to Chicago in 20 hours. But the idea did not prevail, and to-day fast trains run under and over our great cities with safety. Railway agitation to-day properly concerns itself with the elimination of grade crossings and such matters, which is the form of agitation that would be beneficial to motor vehicular development.

The railways even have their yards—such as are necessary—underground or elevated in many instances.

To-day New York City is almost entirely devoid of parking facilities. Many of the streets are narrow, and the driver who takes a chance and parks his car on many streets, leaves a spotless vehicle open to damage by the many motor trucks which throng the narrow thoroughfares.

Despite these conditions, as previously stated, the motor vehicle transportation between Manhattan Island and the suburbs daily is enormous and growing every year, and may be taken as an indication of the pressing necessity for an improvement in the transportation of the city.

The same applies to other cities, and interesting data could be developed by counters along various main thoroughfares, ascertaining the extent to which the motor vehicle binds the city to the surrounding territory.

In 1917 the Long Island Railroad carried 5,912,833 tons of freight and hopes this year to carry 6,250,000 tons. Say two-thirds of this was l.c.l. freight, which enthusiasts for truck use expect to see carried in trucks some day, it would mean 966,800 truck loads or 3223 truck loads for each of the 300 working days of the year. This is not a high figure, it merely means the raising of the number of vehicles which cross two of the bridges from 155,700 to 158,923 if they made the trip both ways loaded, or to 162,146 if there was no return load.

With the present figures on motor traffic in and out of Manhattan there are indications that these vehicles are not approaching their best economic use. In the morning traffic there is an average of about two persons per car. The evening traffic does better, in that the average is slightly above 2.5 persons per car. But on Sunday the cars do better, the average of persons carried rising to above four per car. Trucks do not make so good a showing, as the average is only about 1.46 tons per car. An estimate of the average load capacity of these trucks is 2.5 tons per truck.

These figures merely show that the automotive vehicles are confronted with the same situation as the railroads in getting their equipment loaded to capacity. Time and good economics will eventually remedy this.

But here is the big point: With this volume of automotive traffic developing, what is the cost of unnecessary distance in the roads. Say each of the vehicles accounted for in the above tabulation were forced to run one mile farther than necessary because the highway was not straight. Say the average of gasoline consumption was 10 miles per gallon, or at the rate of 3.5c. per mile, you have this conclusion:

$$155,700 \times 3.5c. = \$5,449.50 \text{ daily.}$$

$$\$5,449.50 \times 365 = \$1,991,067.50 \text{ yearly.}$$

This is absolute waste, because it is entirely unnecessary travel, whether that travel be purely business or recreation. It also explains why the railroads have spent such large sums straightening their tracks to save fuel.

A lot of the work of taking the kinks out of the highways could be done for the cost of the gasoline consumed in going around, instead of straight to the point.

And these figures are for gasoline alone. The remainder of the cost of maintenance of the vehicle can be added to this daily and yearly bill.

Manhattan has felt its growing pains for some time. At present they are acute. The statistics quoted in this

story indicate the extent to which a once city-dwelling population has been squeezed into the outer area. They also indicate the extent to which the motor vehicle, through its passenger- and freight-carrying powers, has made this extension possible. There is no need to dwell upon the desirability of suburban residence as opposed to city congestion, and books could be written on the manner in which transportation in its more modern forms has been a boon to humanity.

One of the greatest developments before us is that of vehicular transportation. Among the things which to-day are pretty much in the dream class may be mentioned these:

1—Highways exclusively for motor vehicles; broad roads, smooth surfaces, adequate safeguards, channels for classes of traffic and safe exits and entrances.

2—The extension of these highways in a network across the country, going, for example, from New York to Boston without having to negotiate any severe grades, without having to pass through any congested spots and without any sharp turns or other speed-slackening factors. The Detroit-Toledo road would be a good place to begin.

3—Elevated thoroughfares in the larger cities. For example, several elevated highways from the Bronx to the Wall Street section of New York, with entrances and exits and channels for fast and slow and truck traffic.

4—Vehicular tunnels or adequate bridges over waterways and other similar obstructions.

5—Most important of all, the building of roads that will stay built. This means scientific roadbeds and proper surfacing, of which we have thus far had but little.

Since time began the world has been continually adjusting itself to more modern forms of transportation. It is still at it. Each adjustment lets civilization out an added notch, makes the business and living circle of each individual a bit larger. Right now we are at a point where the world is straining against the restriction of inadequate highway systems.

Before long the inadequate highway restriction will be a binding handicap on the growth of the automotive industry. To-day is a time to begin, and there is no work more important for the automotive industry than to lend its aid to the removal of this restriction before its effect is too keenly felt.

## Experimental Concrete Road in Denmark

SOME official experiments with concrete roads have been undertaken in Denmark at the instance of the Viborg authorities on the Viborg-Aarhus high road. The experiments were carried on over a section some 1,150 ft. in length and 14.75 ft. wide, the camber being 1.50. The layer of concrete was 6 in. thick and it was strengthened with ribs 10 in. broad and 4 in. deep along the sides. The top layer, 2 in. thick, was made of concrete with small stones ranging from  $\frac{5}{8}$  to  $1\frac{1}{4}$  in. in diameter, the mixture being 1:2:4, while the formation layer was composed of gravel concrete mixed in the ratio 1:4:8. The top layer was placed upon the bottom layer immediately after the latter had been laid. For a short distance the concrete has been reinforced from light longitudinal and cross rods placed  $2\frac{3}{4}$  in. from the surface in a layer of concrete 4 in. thick. Three weeks were allowed for the hardening of the concrete before the road was opened for

traffic. One part was tarred immediately and the remainder was left for a period of nine months for observation. The concrete road, in spite of fairly heavy traffic, has shown no cracks, and with the exception of a few isolated holes, about  $\frac{5}{8}$  in. deep, it shows practically no signs of wear. The cost of the plain concrete portion amounted to about 1 kroner per sq. ft., the value of the old road material partly covering the cost of making up and removal; the reinforcement cost an additional 0.3 kroner per sq. ft., but the experiments have shown that the latter can be dispensed with under certain conditions.

ACCORDING to the Esthonian paper *Waba Maa*, for Aug. 27, ploughing tests were made with the International Harvester Co.'s tractors on Aug. 26, many official persons being present. The results achieved showed that the machines are suitable for use in Esthonia.

# Heavy Automotive Taxes Suggested by Secretary Houston

Retiring Democratic cabinet official would require the automobile and kindred vehicles to pay almost one-tenth of the entire expenses of the National Government, without relief from other taxation.

**I**N his annual report, Secretary of the Treasury Houston has made specific recommendations for raising the \$5,000,000,000 which the present administration considers necessary for running the Government next year. The part of the tax recommendations which are of especial interest to the automotive industry are:

1. Increase of the sales tax from 5 per cent to 10 per cent, which it is estimated will make an increase of..... \$100,000,000
2. A Federal license of cars based on 50 cents per hp..... 100,000,000
3. A consumption tax on gasoline at 2 cents per gallon..... 90,000,000
4. The truck sales tax will be continued at 3 per cent, despite efforts to have it eliminated.

New taxes from industry..... \$290,000,000

The 10 per cent sales tax is applied, as now, to passenger cars, motorcycles, parts and accessories for these vehicles and will include tires.

These recommendations by Secretary Houston are about what those of the industry, who are familiar with the tax tendencies, expected from his report. They are practically the same as those recommended in the preliminary report of the National Industrial Conference Board. When this report was brought up for hearing recently at a New York meeting of the Board, the National Automobile Chamber of Commerce appeared before the Board and asked that these tax recommendations be revised. It was then shown that the automotive industry in 1919 paid almost \$150,000,000 in excise taxes to the national government, as follows:

- 1 Excise taxes on motor car sales..... \$77,000,000
- 2 Excise taxes on truck sales..... 14,000,000
- 3 Excise taxes on parts and accessories. 52,000,000

1919 taxes..... \$143,000,000

In addition the automotive equipment pays:

- State and municipal registration fees... \$64,000,000
- State and local taxes on the valuation for personal taxes..... 50,000,000

\$114,000,000

When this showing was made to the Industrial Conference Board that body immediately agreed that the industry was paying its share of taxes and they decided to make no recommendations for increased automotive taxes. During the hearing a member of the Industrial Conference Board asked if the industry did not want national registration of cars. The answer was that while this might be very desirable, that the industry did not want to pay \$100,000,000 for such registration.

There are some items of curious interest that develop in these tax proposals.

One is that if these recommendations were enacted into laws that the automotive industries would be required to pay, in excise taxes, practically one-tenth of the entire budget of the country and while bearing this heavy load would still be subject to all of the blanket taxes that cover other industries, such as income taxes, excess profit taxes and all local taxes on property valuation and merchants' licenses.

Another is that the taxes planned in this suggested budget are equal to about one-half of the expenses of the government on the last year prior to the war.

If all of the taxes now projected for next year became collectible, it would mean that a possible 8,000,000 cars would be taxed an average of about \$65 each. The importance of the National registration tax becomes especially interesting when it is compared with present state registration fees, which for 1919 were \$64,000,000.

As has been said, there is not much that is new thought in these tax suggestions. The gasoline tax was previously proposed. The stumbling block in the way of that tax is that Congress has no way of exempting the gasoline that is to be used for stationary engines for purely factory purposes, in cooking stoves and for necessary transportation, and Congress has shown no inclination to tax fuel for these purposes. Tax suggestions have to do with the "pleasure" car which is so very hard to find.

The general belief is that the short term of Congress, which will be the finishing up job of the Democratic administration, will not be permitted to take up taxes. The Tax Committee of the N. A. C. C. and other automotive and allied business associations have been assured of this program.

The N. A. C. C. Tax Committee, which is new in form but the work is not new, is drafting a definite tax program and will go before the proper congressional committee with a definite program. This committee is quite certain that these recommendations from a retiring Democratic official will not figure heavily in the plans to be made for the Republican Congress action.

**T**HE establishment of a Chamber of Commerce of the United States at Pernambuco, Brazil, brings the announcement that twenty-eight such organizations are now functioning throughout the world as an aid to the promotion of the foreign trade of this country. The Pernambuco body, which is organized for the same purposes as are the older associations of a similar nature, is the fourth American Chamber of Commerce in Brazil, the other three being at Rio de Janeiro, Santos and Sao Paulo.

Other American chambers of commerce are located in Argentina, Bolivia, Chile, China, Colombia, Cuba, France, England, Italy, Mexico, Spain, Turkey, Germany, South Africa and the Philippine Islands. China leads all other countries in the number, with six. These are at Shanghai, Tientsin, Peking, Hankow, Harbin and Changsha.

# Consider the Labor Problem From the Profit Angle

"War" is too often the only idea that comes out of a labor proposal but experience proves that "fighting" usually is unprofitable and unsatisfactory. The idea should be: That there is something in the problem to understand with a view of promoting the best interests of the business.

By Harry Tipper

SOME years ago when Mr. Edwin Hurley was assistant chairman of the Federal Trade Commission he referred (in his speech before the Association of National Advertisers in New York) to the number of corporations doing business in this country, and the small percentage of such corporations earning any money.

I do not remember the exact figures now, but the total number of corporations was about 100,000 and pretty close to half that number made no net income at all. A few thousand of the corporations of the country made most of the profits. It is to be noted in the records of failures in business issued by Bradstreet, that the outstanding reason for a failure is incompetence, the inability to do the thing which is required to keep the business going.

Even in the more ordinary requirements of business, such as a knowledge of costs, a proper consideration of depreciation, a knowledge of markets and a proper understanding of the expense of marketing, the examinations indicate that there is a very startling lack of knowledge.

Perhaps it is not surprising, therefore, that the human problem should be understood so little and that the methods used to deal with it should fail so frequently in accomplishing what they are expected to do.

The unfortunate part of this situation in connection with the human problem is the tendency for the average man to assert his opinion and defend his position in regard to human matters, where he is more or less willing to be informed by study and by examining the practice of others in the rest of his business problems.

One of the most important results of education is control, and it is to be observed that prejudices and passions are stronger and much quicker in their reaction among people who have not been subjected by inheritance and tradition to a long process of education.

In political matters we are demanding discussions and peaceful settlements and are thoroughly disgusted with the necessity for fighting which still appears to exist. In industrial matters, too frequently, we have not yet reached the stage where we are willing to have our opinions disagreed with, and sit down and consider the other side of the case, or to operate on the plan that discussion and agreement are better than division and warfare.

The very expressions which we use in our discussion of these matters indicate this determination to take sides and prove that our side is right altogether and the other side altogether wrong. We don't seem to realize that it

is possible for a man to be a radical without endangering society, and it is possible for a man to be a reactionary without being a soulless autocrat.

The labor union leader can see no justice in industry except through the intervention of the union and the carrying out of its program. Many manufacturers on the other hand can see no justice in the union program at all, and, apparently, believe that nothing can be accomplished except by the destruction of that type of organization.

The man who has the courage to see both sides of the case and to call the turn on what is right and what is wrong, is disowned usually on all sides. Of course, that is not true of all manufacturers by any means, but it is true of a great majority of the manufacturers or owners of industrial establishments and it is true of a great majority of the labor organization leaders. Here's a pertinent case:

We are writing you at this time to attempt to get you or your company into The Open Shop Association.

As the time is ripe for all manufacturing concerns to run their shop as they see fit and not be dictated to by some unscrupulous delegate of some union.

You may see the point that we are driving at very clearly. The Open Shop Association will do a great deal for its members.

1. Should you be threatened with a labor controversy or strike, you can immediately get in touch with us and we will handle that situation for you.

2. Should you want an under cover man on the inside amongst your employees we will also furnish you such a man, and you will receive a daily report on what is going on.

3. In the event of trouble we will replace any men that may strike against you.

4. We will establish welfare clubs in your plant from which you derive a lot of benefit, and all manufacturers are alive to this issue.

Our membership is growing larger every day and we would be glad to have you also fill out the accompanying application for membership in this institution.

The initiation fee is \$50.00, and the yearly dues \$25.00.

Trusting that you will acknowledge receipt of this letter, we remain,

Yours truly,

American Employers' Open Shop Assn.

The whole tone of this letter presupposes that the labor situation demands warfare and the kind of warfare which does not exhibit too many scruples as to methods. This organization offers to take the situation out of the hands of the manufacturer, to furnish detectives who will give inside information, to furnish strike breakers and at the same time to establish a welfare club.

The man who has charge of any industrial plant is responsible for the human relations in that plant. It is his business to obtain men who will be stable in their employment, efficient in their work and contented in the organization. These things cannot be done unless the manager of industry knows the men who are working in his plant and understands them thoroughly.

To take any controversy out of the hands of this man and put it in the hands of an outside organization is to reduce the possibilities of settlement to the vanishing point and remove the responsibility for study which belongs to the management of business.

There must be some sarcasm in the paragraph which indicates the establishment of welfare clubs or else the words are unfortunate, as it is not usual to employ detectives to find out about people and at the same time offer them the glad hand of fellowship because of our interest in their welfare.

The history of the development of industry shows very definitely that the continuance of warfare has resulted in a distinct loss to the manufacturers. The laws which are on the statute books governing industry are the result very largely of this warfare, through the public attention which it has drawn to industrial matters.

The completely unionized condition in some industries is again the result of this warfare, the lack of interest, the suspicion and the other troubles which are familiar to every manager of labor have been intensified and deepened by the same process.

Even if the manufacturer wins a strike he loses in his future possibilities of production. Even where it is necessary to refuse agreement with labor because of its unreasonable demands, the necessity is an unfortunate one and leads to the destruction of industrial efficiency, just as clearly as the late war led to a destruction of political and governmental values.

The time which is spent in labor controversies which might have been spent in doing the work, represents an enormous loss every year, but that loss is only the smaller portion of it. The loss of incentive, the destruction of any idea of mutual obligation, the lack of interest in the work, and so forth, reduce the potential capacity of the individual to an extent which we have never visualized.

William James said that no man used more than 50 per cent of his intellectual capacity and for a great deal of the work which is done, that percentage would be liberal. The field for improvement in this respect is sufficiently large to be worth considerable attention. It cannot be developed without study, study which is at least as sincere, as careful and as pertinent as the study which is given to the mechanical equipment and the physical arrangements of manufacture.

It would be infinitely better if we would take a chip from our shoulders in regard to this industrial relations matter, and make use of a magnifying glass, so that we could see the things which escape our notice at the present time and which are more important than the physical symptoms of a strike or the temporary fluctuations back and forward in the efficiency of the individual worker.

When I was a boy, one of my respected teachers used to say about fighting, "Yes, I know you want to fight, you think you are insulted because you have disagreed, but fighting never bettered anything nor settled anything. Sometimes it cannot be avoided, but it is always unfortunate and in 90 per cent of the cases a little under-

standing would turn a prospective fight into an enduring friendship."

There are two things about the history of industry for the last 50 years which ought never to be allowed to slip from the mind of every man who has to handle men. They illustrate so thoroughly the methods which are available and the methods which have proved useless, that there is a clear, well-defined prospect before the man who really desires to better the industrial relations and is not concerned particularly with the establishment of his own prejudices or the carrying out of his own ideas regardless of their value.

The first of these is the result of the general progress of warfare between the craft unions as they have been organized and the employers, despite the fact that the growth of the craft unions has been fought out every step by the employers and in many stages fought very ruthlessly, these unions are far more powerful to-day than they were at the beginning of the warfare, and they are supplemented by a number of other unions which have grown up in the meantime so that the general union movement has increased very greatly.

It is true that in times of unemployment the union's privileges have been discarded to some extent, but when those times are past, such privileges have been restored and further advances have been made.

This is sufficient to indicate that there is no prospect of anything but a very temporary advantage in a continuance of the fight. What the manufacturer has apparently gained in winning one strike he has lost in a few years thereafter and the general record indicates that he has lost a good deal in the period of time over which the controversy has raged.

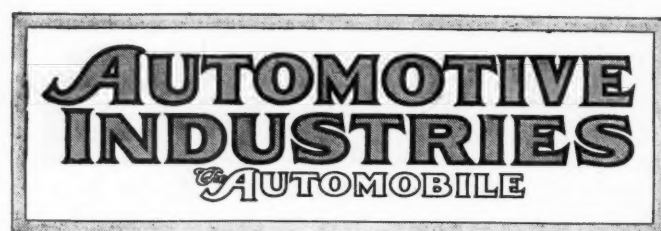
The second point of importance is the existence of individual establishments in almost every line of industry who have been able to avoid this warfare and who have been able to continue for many years without the existence of strikes or any big elements of labor trouble.

There are a sufficient number of these, and many of them are sufficiently old and well established to indicate that the individual plant can arrange its affairs with its workers so that they are contented, and are willing to disagree with their union on the strike question.

The present is a good time to study the labor relations because there is not the slightest suggestion of compulsion upon the manufacturer to do this, and any rearrangements which come out of his study will be more valuable on account of that fact.

## Principles of Airplane Flight

A HIGHLY practical discussion of the principles of airplane flight is contained in "The Airplane" by Frederick Bedell, recently published by D. Van Nostrand, 25 Park Place, New York. In this book the author has treated the subject in a simple, fundamental manner and without the use of higher mathematics. No space is given to tracing the historical development of the airplane or to mere descriptions of type of planes, but the particular subject of the book is adhered to without attempting to cover ground frequently covered in more exhaustive works. Chapters are devoted to sustentation, resistance, thrust and power required for propulsion, climbing and gliding, performance at different altitudes, and longitudinal, lateral and directional stability. The book is well illustrated with diagrams and curves. It should serve well as a text book in elementary applied aerodynamics, or for the guidance of those interested in the basic principle of flight of heavier than air machines. It is also a useful reference book for engineers and designers interested in aviation.



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## Against Commercial Bribery

IN these days when so many organizations are moving for legislation that strike at personal rights and pleasures, or which will become purely restrictive laws, it is rather refreshing to find an organization which is moving against a real evil, one that no honorable man will defend and which has become so deep rooted in business that many determined men have given up the fight to eradicate it. The movement referred to is that by the National Association of Purchasing Agents to obtain the passage of a bill that will make commercial bribery a penal offense. A definition of commercial bribery, as the purchasing agents see it, is "the giving of payment or gratuities to influence the purchase or acceptance of goods." The bill as drafted would extend immunity to the first informer.

It would seem that manufacturers and others who must rest so much of their cost of production on a purchasing department would strongly favor this measure. The movement to introduce such a bill into congress is under way and we suggest that in the

interests of better business that manufacturers urge its passage. The Federal Trade Commission has shown that such abuses of business position are very great.

## Fuel Economy Contests

DURING recent years the automobile industry has not shown much enthusiasm for contests of any kind, which may have been due to the fact that business was so good that contests could not have made it any better. It will be admitted, however, that contests bearing on features to which the public attaches considerable importance at the time, have a powerful influence in quickening development of design.

As fuel saving is now such a vital issue we believe that much interest would be shown by the automobile public in a fuel economy contest held next spring. It is well known that American cars are sadly lacking in economy, our engineers having paid slight attention to this factor in the past, because fuel was relatively cheap and plentiful and customers laid much stress upon other qualities that conflict with economy. This was well shown in the recent French economy contest in which the several American cars entered made a poor showing in spite of having been fitted with special carbureters and tuned up by experts.

In the French trials an attempt was made to rate the performances of all the entries, from a cyclecar to a truck, by formula, so that there would be a single winner of the whole event. The wisdom of this plan is rather doubtful. Any formula that can be evolved must necessarily be of an empirical nature. For instance, everybody will agree that increased speed within reasonable limits is an advantage, but we would never get anything like unanimity on the question as to what difference in fuel economy would be balanced in value by a gain in speed from, say, 20 to 21 m.p.h.

We believe it would be a much better plan to divide the contestants into fairly numerous classes, so that only cars within such a price range as might appeal to the same purchaser would compete with each other. Of course, there would still be the ton-mile per gallon record of all contestants, and any specially meritorious performance would not be lost sight of. It will be readily seen that from a commercial standpoint it would be of little consequence if a \$6,000 car showed a better economy than a \$500 machine on a ton-mile per gallon basis. But to be the winner among a number of cars of substantially equal price or cylinder displacement would be a distinction that could be readily capitalized in a sales campaign.

In addition to stimulating research and technical development in connection with the more economical use of fuel, such a contest would have another beneficial effect. Numerous parties all over the country have been selling "fuel economy" devices for which they claim anywhere from 20 to 50 per cent saving in fuel. The public has generally been asked to take these statements on faith and has had little chance of checking them up. If economy contests were held regularly the buying public would soon learn to ask for official performances, and if these were forthcoming, would be guided by same. If no official performances

could be cited any claims of unusual economy would be regarded with skepticism.

If an economy contest was decided upon, the rules, of course, must be very carefully drawn up, so that when the results are announced they have a definite practical meaning. The greatest precautions must also be taken that all chances of error and all possibility of fraud are eliminated. Unfortunately there does not seem to be a single organization of standing in the automobile world that has facilities for conducting such trials, unless it be one of the larger dealers associations. We have not had a contest of a practical nature in this country for so long a time that our machinery for conducting them has become disorganized. However, if the contest itself is worth while—and we believe it is—an organization capable of conducting it will be found.

## Reform of German Engineering Education

SINCE the armistice, German engineering schools have been much interested in plans for reorganizing their courses of study in accordance with "the newer intellectual aims and the economic shackles which resulted from the disastrous outcome of the war." At a meeting of the Society of Engineering Education held in Halle in May, definite plans were laid for bases on which the courses of study in mechanical and electrical engineering in all of the more important engineering schools of the country will be rearranged for the coming winter semester.

What led to this reform movement was chiefly the fact that the material to be dealt with in these courses under the old, rigid plan had grown to such an extent, owing to the enormous development of the industries concerned, that it could no longer be properly handled in the eight semesters composing the regular engineering course, and extending the course beyond the eight semesters was out of the question owing to the impoverishment of the country through the war.

It was decided to divide engineering courses into two parts of four semesters each. The first of these is to be devoted to a fixed curriculum and is to give the student the necessary equipment in the line of mathematics and physical science which is necessary in order to successfully master engineering problems. The subjects covered in the first half of the course would include higher mathematics, descriptive geometry, theoretical mechanics including properties of materials and graphostatics, physics and chemistry.

The second half of the course is to be entirely elective, and it will be left to the student whether he wants to acquire a broad general engineering education or go deeply into some special branch. The examination authorities will see to it that the subjects selected in the aggregate make up a course that may be regarded as of full value, and the examinations will be adapted to the studies pursued by the individual students.

While the first half of the course is to be devoted chiefly to the fundamental sciences, such as mathematics, it is not intended to go as far into these

sciences as has been the practice in the past, but only to give enough of them to meet the needs of those students who expect to go into administrative engineering work. Applied mathematics will be taught in the second half of the course, and it is hoped in this way to meet the complaint of some students with no particular fondness for mathematics and similar studies, that they are burdened with a lot of work for which they will never have any practical use. The time gained by limiting the instruction in mathematics and the physical sciences in the first half is to be devoted to economics and commercial practice.

It is believed that the new plan will be greatly to the advantage of students of higher intelligence, who will be able to progress much faster than under the old plan of a rigid course of study. It is also believed that it will work out to the advantage of the industry, as industrial concerns will no longer be compelled to pick junior members of their technical staff from a lot of young engineers all educated according to the same program but may obtain men educated in the particular branches in which their work lies. The preliminary course or first half is to be equivalent at all German engineering schools, in the interest of free migration.

## Protection of "Good Will"

EVERY once in a while the courts speak out sharply concerning imitators of others' business policies. Recently a Nebraska judge restrained one of these imitators from doing himself and his customers further injury. This man, after investigations worthy of a better cause, succeeded in making a spark plug that was a very good imitation of one well established in the trade and which happened to be the plug selected for regular equipment on the Ford car. The imitator advertised that his plug was "standard equipment for the Ford car." He probably convinced himself that he had a right to do this because the plug was of the same type. But the court took another view and stopped him, saying that the company manufacturing the plug originally had a legal right to the "good will" created by selection of its product as Ford equipment. The strangest feature of such cases is that usually the same amount of energy put into a strictly honest endeavor would have brought success.

## Insurance Men Ask Aircraft Laws

IT is interesting to note that the National Aircraft Underwriters' Association has decided to urge upon Congress the need for aircraft laws. It is perhaps surprising to some persons, even to some of those interested in aircraft, that flying has become so widespread that the insurance companies are taking it into consideration. It is significant for the future of aircraft that this is so. All those interested in the development of aeronautics should assist in this effort. There never has been a single sound argument against national laws for control of aircraft, but much sound argument for such control.

# Industry Prepares for Trade Return

## Factories Outline Larger Schedules

### Promises of New Business Assume More Definite Form—Outline Sales Policy

DETROIT, Dec. 5.—Signs of recovery from the depression and the consequent slump in the automobile industry plainly are evident in the optimistic statements of manufacturers and dealers. While there is no attempt to ignore conditions or assume a too buoyant attitude there is a feeling permeating the industry that the upward trend will start with the show season and conditions gradually will improve with demand close to normal with the coming of spring.

W. J. McAneeny, president of Essex Motors, expressed the opinion that the New York show would see a sharp upward trend, and this conviction is shared by Alvan Macauley, president of Packard; F. J. Haynes, general manager of Dodge Bros.; C. D. Hastings, president of Hupp; H. M. Jewett, president of Paige, and G. C. Layng, vice-president of the Cadillac Motor Car Co.

Manufacturers, after close analysis of the situation, are agreed that the real problem now before the industry is one of energetic and aggressive merchandising backed by a conservative and sane manufacturing policy. That this will be reflected in the efforts of the manufacturers to outline a more comprehensive merchandising policy and insist on strict adherence to it, is shown in the plans already outlined for dealer conferences at the New York show.

Conditions in this district have ceased to be alarming. On the other hand, there is a more cheerful attitude apparent. Factories that have been down completely are again in production on a limited scale or are getting into condition for a resumption of operations. Reports from dealers throughout the country, manufacturers say, are optimistic, and marked improvement is indicated.

#### Olds to Start on 30 a Day

Olds Motor Works at Lansing, which has been out of production for several weeks, again was started Nov. 25, and the various departments will be put into operation gradually on a schedule of 30 cars daily, which schedule it is hoped to maintain until such time as demand justifies an increase.

Buick officials announced a reduction of 200 cars a day in output beginning Nov. 1, putting the daily schedule at 350. While the Buick factory has been operating full time the employee force has

## MOTOR CAR INDISPENSABLE FACTOR IN INDUSTRIAL LIFE OF NATION

CHICAGO, Dec. 4.—The National Bank of the Republic of Chicago does not have to be convinced of the indispensability of the automobile; it is convinced already.

In its monthly review of business it discusses the automobile situation. "It was to be expected," it says, "that the automobile industry should experience something of the same process of readjustment through which other industries are now passing. Due to the magnitude of the industry and to the large number of competing units it was inevitable also that contraction should be sudden and drastic. The impression had gained currency earlier in the year that the point of saturation had been reached in the distribution of automobiles, and it needed but the threat of widespread unemployment, or of decreased purchasing power in any section of the country, as for instance the grain states, to make the saturation a reality, temporarily at least.

"Once the ice was broken by the largest producer in the field, price cuts and curtailment became general of necessity. Except in one or two instances the naming of lower prices has been ineffectual in increasing sales, with the result that curtailment has continued general in the industry. As regards the immediate outlook, great stress is laid on the fact that normal replacements should take up at least one-half of the motor manufacturing capacity.

"But the saving fact in the situation is that THE AUTOMOBILE HAS LONG SINCE REACHED THE POINT WHERE IT BECAME AN INDISPENSABLE FACTOR IN THE INDUSTRIAL LIFE OF THE COUNTRY, AND AS SUCH IS ASSURED OF A STABLE FUTURE."

been cut materially and the plant has not kept to schedule. Reports from Buick dealers indicate a steady demand with an apparent upward trend as the consumers become convinced that price cutting has ceased. Buick is one company that still is behind in deliveries. This is noticeable particularly in the Eastern territory. Despite the steady demand and the confident feeling that buying will reach somewhere near normal in the spring, it is hardly likely that the Buick factory will attempt to get beyond the production outlined in the readjusted schedule.

#### Reo Keeping to Normal Output

Reo Motor Car Co. is one of the few that is keeping to normal output. While there has been some cut in time schedules, Reo has not decreased its force and the factory can be said to be operating at capacity with the production program divided about 55 and 45 per cent with the speed wagons getting the larger share.

Cadillac, despite the fact that the employee force has been cut materially, is keeping to an output approaching normal, around 2000 cars a month. Cadillac factory, according to Layng, is working full time six days a week; increased efficiency of labor permitting maintenance of the normal production schedule despite the cut of between 35 and 40 per cent in the working force.

Ford Motor Co., which has been keeping above the announced schedule of 4000 since Sept. 1, will close down Dec. 15.

The plan is to utilize the time until the first of the year in taking inventory. No one would say definitely at the Ford plants that operations would be resumed immediately after New Year.

Hudson-Essex officials, having balanced inventories and put both factories into shape for resumption of full time schedules, are negotiating contracts for parts and materials with the idea of getting both factories into operation on a limited production schedule with the idea of keeping close to demand but never anticipating it and creating a surplus in consequence. The Essex plant is closed tight, though according to President McAneeny, the Hudson plant is being operated and both types of cars are being produced there. President McAneeny said it was proposed to build 1100 cars during December, but declined to say how the output would be divided as between Hudson and Essex or what cars had been produced in November.

#### Masten Confident Tide Turned

W. H. Masten, general manager of Oakland at Pontiac, declared he had full confidence in the future and expressed the opinion that the tide had turned. Masten also predicted that the show season would see a noticeable improvement in demand and predicted a continued upward trend with the probability that the curtailment in production in the last two months would result in inability to supply the demand in the spring. Oakland had planned to resume operations, after

(Continued on page 1192)

# Normal Business Soon, Says Reserve

## Transition Process Nears Completion

### Little Further Distress Seen in December Statement—Ex- change Hurts Exports

WASHINGTON, Dec. 5—Normal business conditions will soon be restored with far less than usual distress, declares the Federal Reserve Bulletin in its December issue. There is good reason for believing, it asserts, that the difficulty of the transition process through which business has been passing will not be much further aggravated.

The foreign exchange situation is declared to be in some measure responsible for the slowing down of the export trade of the United States, and illustrates further the necessity of action designed to bring about soundness in international financial relations.

Easement of credit conditions with reductions of rates of interest on call money, time funds and to a moderate extent for commercial paper was set forth in the Bulletin. Country banks have been active buyers of commercial paper during November principally as a result of the liquidation of farmers' obligations.

The Board has noted further price recessions as the general index shows a net loss for the month of eighteen points. Activity of manufacturing in many lines has been still further reduced and there has been some increase in unemployment. There has been a corresponding reduction of buying power which is reflecting itself in a noticeable way in a lessening in the volume of trade.

While business failures have continued to increase as compared with a year ago, the total growth in assets of failed concerns has been moderate. The general opinion of bankers and financiers is to the effect that the process of readjustment has been kept under control and has produced as little economic disturbance as might reasonably have been expected. It is impossible to estimate the extent to which the completion of the readjustment process may involve further slackening of employment or the increase of commercial embarrassment.

### H. E. MONFORT DIES

ROCK ISLAND, ILL., Dec. 3—Harry E. Monfort, assistant superintendent of the Rock Island Plow & Tractor Co., died here of apoplexy. He was aged forty-nine and for eight years had been superintendent of the La Crosse (Wis.) Plow Co., and had also held important positions with the Syracuse Chilled Plow Co. and the Oliver Chilled Plow Co.

## TURNING POINT NEAR, FEDERAL RESERVE VIEW

In its December Bulletin the Federal Reserve Board says:

"The fiscal situation both at home and abroad is still uncertain, due to the fact that while the war was technically over at the signing of the armistice it was not over in the financial sense until a long time later, while it has not been possible during the readjustment period to place public finance in any country upon its peacetime footing, pending much closer ascertainment of the best method of taxation.

"The close of the year 1920, however, in spite of the fact that in some branches of economic and financial life there is still much progress to be made before reaching a definite basis for further growth, must nevertheless be regarded as quite unmistakably a turning point in the process of transition from conditions produced by the war to the normal economic basis of international and industrial life."

## Railroads Increase Equipment for Cars

NEW YORK, Dec. 6—The Wheeling & Lake Erie Railway has informed the traffic department of the National Automobile Chamber of Commerce that in ordering 1000 new box cars it has followed the suggestion of Traffic Manager Marvin that the cars be provided with staggered doors 7 feet in width. The Kansas City Southern is arranging to widen the doors of 100 of its furniture cars to take care of automobile shipments. The 3500 automobile cars ordered by the New York Central will be delivered beginning this month. The car service division is urging all railroads to repair and rebuild equipment now to meet needs later.

### TO MAKE DETACHABLE RIM

SYRACUSE, Dec. 3—The Federal Detachable Rim & Wheel Corp., capitalized at \$2,000,000, has filed a certificate of incorporation in the County Clerk's office. It will manufacture and sell a detachable rim especially adaptable to types of automobiles not regularly equipped with demountable rims. It also holds patents for other automobile accessories which will be marketed later. The stock is equally divided between preferred and common. The president of the company is D. Robert Croly and James H. Higgins is the secretary and treasurer.

## Few People Buying, Reserve Bank Notes

### Lack of Finances Prevents Usual Manufacturing Now for Spring Business

CHICAGO, Dec. 6—Recession in business activity both from the viewpoint of production and consumption is noted by the Federal Reserve Bank of the Seventh District in its monthly summary of conditions. This decline is accompanied by steadily increasing unemployment, though readjustments in both industrial and commercial lines are proceeding in an orderly fashion. The district includes Detroit.

With specific reference to the automobile industry the bank finds that "in the automobile industry there is a marked slowing down both in production and shipments, as is evidenced by the movement of cars from the factory by rail, boat and driveaway, and by the increasing number of unemployed in automobile centers. Advices from automobile manufacturers are that very few people are buying and that consumers are putting off the day of making commitments, hoping for further price reductions.

"With the exception of some of the larger automobile manufacturers, plants are reported either to be closed or operating on such a small scale that their production is running not much in excess of 20 per cent of normal. There are at least four plants in the Seventh Federal Reserve District which report operations from 50 to 75 per cent of normal.

"While the compilation of figures showing the number of cars produced during the twelve months ended June 30, 1920, has not been completed, it has progressed sufficiently to indicate an output of approximately 2,000,000 automobiles and 340,000 trucks for the year. The output of motor vehicles during the calendar year 1919 was 1,657,652, and the number of trucks 316,340.

### Finances handicap storage

"During the winter months automobile manufacturers produce the stock of cars which are sold and delivered to users during the early part of the coming automobile season. A year ago manufacturing was at high speed, owing to the ability of dealers to stock up and finance these operations. Manufacturers are unable to store cars ahead, both for financial reasons and for want of space; and the credit situation, as well as uncertainty as to the probable requirements, is restricting the demand from dealers for cars to be stored by them against next year's requirements." Unemployment apparently is growing.

## Business Integrity Remedy for Slump

### United States Chamber of Commerce Urges Return to First Principles

WASHINGTON, Dec. 6.—Cancellations which created considerable uneasiness in the automobile trade and other business of late were in the main due to loose business practices and other irregularities incident to wartime, according to the conclusions reached by the Fabricated Production Department of the Chamber of Commerce of the United States to-day in an analysis of the cancellation evil. It is suggested that the most effective remedy would be a quick return to the fundamentals of sound business and the establishment of firm integrity.

"We feel" says the National Chamber, "that perhaps the most effective remedy must be the one that will call us back to first principles, to where we can point with pride to our house as one that fills its orders and keeps its contracts. There are many in all lines who have through all this upheaval stood steady and right—preferring to take loss rather than mar a lifetime record of good performance."

"Dun gives the total volume of commercial failures in May, 1920, as \$10,826,277, and in October, 1920, as \$38,914,659, while in October, 1919, the total was \$6,871,966. But the monetary loss was not the greatest loss, although many went to an untimely business grave because somebody did not make good."

"The apparent lowering of business standards has made doubtful the value of business written and placed upon the books for future shipment. Production schedules could not be definitely worked out because of this increasing doubt."

### C. C. U. S. DISCUSSES GUARANTEES

WASHINGTON, Dec. 3.—Both sides of the question of price guarantees are given in a bulletin issued by the Fabricated Production Department of the Chamber of Commerce of the United States. The important argument in favor of this practice is that it makes for more economical production and distribution. In opposition to this it is stated that it is an unsound, unfair business practice, because it creates an artificial volume of orders for the manufacturer, and because it puts the wholesaler's and retailer's just share of liability for market fluctuations on the manufacturer. It is also said that it tends to keep prices up, and reacts unfavorably on the small manufacturer.

### NORTHWAY MOTORS SECURE

BOSTON, Dec. 4.—James F. Cavanagh, president of Northway Motors, has written a public letter to call attention to "false rumors and malicious statements, obviously intended by their creators to impede the continued progress and successful development of Northway Motors Corp. to injure the sale of Northway trucks, and to depress the market value

of the stock issues of the company."

This comes as a result of a rumor that Northway Motors had suspended operations of its Natick plant. After a statement of actual business and workers at the plant he said: "The general business depression, which has temporarily closed various Western automotive plants and many Eastern industries, finds the Northway plant at Natick in continuous and successful operation."

## Open Winter Signs Aid New England Trade

BOSTON, Dec. 4.—A. H. Sowers of the Lexington Automobile Co. said yesterday on his return from a swing around the circle through Maine, New Hampshire, Vermont, Western Massachusetts and Rhode Island:

"In the States above us the people have figured out that we are going to have an open winter. They pointed out that this time last year in some places they were buried in snow, and remained so until spring. Many places I visited the ground was green and the roads good. Some places the farmers had busied themselves with breaking out the ground instead of waiting until spring."

"Commercial travelers said they were not getting a whole lot of orders, but neither were they getting hard looks and cancellations. People had resumed buying a bit more freely. My dealers have recovered from the dumps and they are out now selling cars and tractors."

## Simons Finds Sales Largest in History

DETROIT, Nov. 29.—By way of dispelling gloom and injecting enthusiasm into his dealer organization, Guy O. Simons, president of Simons Sales Co., Overland and Willys-Knight and Handley-Knight distributors, told a gathering of more than one hundred Overland dealers that September and October business of the concern was the largest for the same two months in the company's history. Despite the slump the firm up to the end of October had delivered cars exceeding \$4,500,000 in value, and with two months remaining in the year had beaten the 1919 record by \$1,250,000.

While his statements and comparisons dealt specifically with his company, Simons stressed the point that readjustment had not affected automobile sales to anything like the extent the public had been led to believe and declared the facts with regard to his own concern were true in many other cases.

### GIVES TEN-YEAR GUARANTEE

INDIANAPOLIS, Dec. 3.—Twenty five pumpers and ten service trucks have been purchased by the city of Indianapolis from the Stutz Fire Engine Co. as part of the plan to completely motorize the city fire department. The company has given bond to the city under which the company agrees to make all repairs and replacements for ten years.

## Central Ohio Finds Revival in Demand

### November Best Truck Month in Past Six—Financial Situation Easier

COLUMBUS, Dec. 4.—With the present year coming to a close, an improvement in the automobile industry is reported in central Ohio territory. The lull which took possession of the passenger car and truck market in the latter part of September and October is passing slowly and in its place is appearing a better feeling. This has resulted in increased sales of motor vehicles, although business is not near normal and will not be for some time.

In the truck business is the most decided improvement. Prospective purchasers are not hesitating as much as formerly and are placing orders. Truck users are not especially increasing their truck equipment, but are buying to replace worn-out equipment. Inquiries are more numerous and Columbus truck dealers report November the best in five or six months. Prospects are good after the first of the year, when Christmas buying is over and retailers have cleaned up stocks and have money for increasing truck equipment.

In the passenger car field, while improvement is noticeable, it is not so pronounced as in the commercial vehicle department. All lines now have price guarantees or reductions and the public is not showing the hesitancy it exhibited previously. While buying is being done cautiously, sales are more frequent and this shows a better feeling. The purchasing power of the public as far as the city is concerned is not impaired to any great extent and dealers expected that sales after the first of the year will show a marked increase. In the rural sections the passenger car industry has been hard hit by low grain and stock prices and little is expected from that source in the immediate future. Farmers generally are holding off, as they are holding their grain for higher prices.

As to the financial situation, some improvement is reported from all parts of central Ohio. Bankers are becoming more liberal and the financing of dealers is going ahead on a more liberal plane. Money is in fair supply and bankers have changed their policy on loans to dealers and distributors.

### TO AUCTION MOORE PLANT

DANVILLE, ILL., Dec. 3.—The buildings, automobiles and all other property of the Moore Motor Vehicle Co., which has been in the hands of a receiver for the past four months, will be sold at public auction Dec. 22, following the issuance of an order by Judge English in Federal Court. C. B. Thomas, the receiver, will be in charge. In addition to the buildings and contents there is a tract of 58 acres of land, together with the underlying coal and other minerals.

## Business Must Meet Demands on Prices

### Cleveland Bank Lays Tie-up to Buyers Strike for Purchasing Rights

CLEVELAND, Dec. 6—In the latest monthly business review issued Dec. 1 by the Federal Reserve Bank of the Fourth District it reiterates the statement made in the last bulletin that passenger automobile makers are inclined to optimism for the future.

"A prominent manufacturer has stated to us," continues the letter, "that the apparent slowing up of the industry is seasonal and that the volume of fall business compares favorably with that of former years except for 1919, when apparently the demand for cars was in excess of the ability of makers to produce them.

One of the large motor truck makers says that "the motor truck business with us, and from all accounts we have from other manufacturers, is only about 20 per cent of normal, and that the slacking off of business has so increased the overhead that it will consume some slight reductions made in materials."

The demand for automobile bodies has slumped in proportion to the lessened demand for cars and prices are being slightly revised, according to the report.

Business in practically all lines throughout the Fourth Federal Reserve District continues to recede in volume. Buying has been greatly restricted, and the result has been felt all around the circle from consumer to manufacturer. Cancellations are still being received, although the tendency to cancel orders is not as marked as during the past few months.

Labor continues to increase in effectiveness and unemployment is increasing. Collections continue good in most lines. Inventories are large in many instances, but the volume of loans required to carry them has been substantially reduced.

### Buying Must Be Stimulated

"The foremost problem confronting business today," the bank says, "is how to secure a return of the public to the market and to stimulate buying. Business is again suffering from a strike, but this time from a new and unexpected quarter. It is not a strike for shorter hours nor for higher wages, but takes on the nature of a strike for recognition that the public holds the purchasing power of the nation and that it will not be drawn into the market except for absolute necessities until it is convinced that prices are as low as may reasonably be expected and bear some evidence of stability.

"How best to secure a resumption of buying is a problem that each business man must solve for himself. But regardless of how the desired result is to be brought about, it is evident that the entire burden of readjustment cannot be

## CONDITIONS SPOTTY; WATCH NORTHWEST

NEW YORK, Dec. 6—Business conditions and trade possibilities throughout the United States are "spotty." There are a few sections where sales continue good but in general there has been a marked recession, although a better trend is becoming apparent in many places.

The states in which business now is best are California, Oklahoma, Florida and Maine. Trade conditions are dull or slow in the steel centers and in most of the industrial sections, but a marked improvement seems to be about due in Pennsylvania and Ohio.

There are unmistakable evidences that the late winter or early spring will bring improved sales conditions in New York, New England and most sections of the South. The process of adjustment is not yet completed, however, and the industrial field will be filled with uncertainties for some time to come.

It is highly probable that the final turn toward normal will first appear in the industrial section of the Northwest. That district was the first to hit bottom and it probably will be the first to recover. It may be regarded as a sort of industrial barometer, and manufacturers will make no mistake in watching it carefully.

passed to the ultimate consumer. Substantial progress in the readjustment has been made in some quarters. Manufacturers have vigorously tackled the proposition of disposing of large and expensive inventories with a considerable degree of success.

### Retailer Nullifies Price Cuts

"Wholesalers and jobbers have in many cases made substantial cuts in prices in an effort to stimulate buying, even though such reductions carried with them losses in greater or lesser degree. Justly or not, there are many who insist that the retailer has nullified any good accomplished by the wholesalers and manufacturers by refusing to reduce his prices to a cost replacement basis."

### CARBURETER WEEK OPPOSED

NEW YORK, Dec. 4—The suggestion of the Standard Oil Co. of California that a carbureter adjustment week be held in that section where there was some shortage last spring, has not met with the approval of the directors of the National Automobile Chamber of Commerce. It is felt that such a campaign would cause unnecessary alarm, and make it appear that a shortage was pending, whereas it is the opinion of prominent oil men that the supply of gasoline will be ample. Final decision on the subject was left to the California dealers.

## Crop Prices Keep Southern Sales Low

### Normal Business Considered Year Away—Many Used Cars Placed on Market

NEW ORLEANS, Dec. 6—General business conditions in the South have suffered severely because of the slump in the cotton, sugar and rice markets. The planters who produced these crops at war costs will have to sell them at losses ranging from 17 to nearly 35 per cent. Labor is still on a war basis. Materials are still high and there has not been any reduction in retail prices of foodstuffs comparable with those the wholesale reductions would lead the consumer to expect.

There is little probability of any return to conditions resembling normal before the maturing of next year's crops. In order to effect this revival costs of production will have to fall an average of 30 per cent. This means either that wages must be reduced or that 30 per cent of the men now employed in the crop's production must be laid off and the remaining 70 per cent forced to produce all that the 100 per cent are now producing.

Just how this will be accomplished is not clear, even to the producers. Approximately two-thirds of the labor of Louisiana, Mississippi and east Texas, excluding the oil fields in East Texas, is employed in the production of cotton, sugar and rice. During the war and up to six months ago these people enjoyed a prosperity they never had enjoyed before and never had expected. The result was that 99 per cent of the producers, both planters and workers, spent their money extravagantly. As an example of this it is stated that there are more than 2000 used automobiles for sale in Louisiana to-day by owners.

This statement of conditions should not be misconstrued, however, as meaning that there is no purchasing power in this section of the South. There are still vast sums available and a great part of this money will be spent in the next year. Automobile dealers who are employing modern business methods in the search for sales are having a fairly profitable business.

It is probable business in this territory in the next year will exceed that of any pre-war year, but it will be far below the level which was reached after hostilities began and the world came to the South for these three great staples.

### BLACK & DECKER OPENS OFFICE

BALTIMORE, Dec. 4—The Black & Decker Mfg. Co. has established a branch at 303 Penn Avenue, Pittsburgh, in charge of W. D. Royer, formerly sales engineer of the Robbins Electric Co. of Pittsburgh. A service station will be maintained and the branch will be headquarters for adjacent parts of New York, Pennsylvania and West Virginia.

## Automotive Studies to Cost \$1,800,000

### Governmental Bureaus Outline Investigations Affecting In- dustry for Coming Year

WASHINGTON, Dec. 6.—Appropriations aggregating \$1,800,000, which will directly affect the development of the automotive industry, were asked of Congress to-day in the estimates for the fiscal year ending June 30, 1922, as furnished by the several executive departments and other Government offices to the Treasury. This figure is based on the items in which the industry has manifested an interest, and represents a substantial increase. Provided Congress approves the estimates without reductions, the departments concerned will be in a position to expand their activities.

There are four Government bureaus with which the automotive industry has direct relations: The Bureau of Standards, the Bureau of Public Roads, the Bureau of Foreign and Domestic Commerce and the Bureau of Mines.

The Bureau of Standards has asked for an appropriation of \$100,000 which will permit the establishment and maintenance of a new division dealing exclusively with automotive engineering. This fund will be expended for the maintenance and equipment of automotive engine test plants, including vacuum and refrigerating machinery necessary to simulate atmospheric conditions at altitudes up to 40,000 ft., supplies, equipment, and operation of laboratories for testing engines and materials used in their construction and operation, lubricants, carbureters, ignition devices, radiators and cooling systems, chassis and power transmission systems, and other researches incident to the standardization and development of automotive power plants.

The bureau further proposes to spend \$45,000 to develop methods of testing and standardizing machines, motors, tools, measuring instruments, and other apparatus and devices used in mechanical, hydraulic, and aeronautic engineering. An appropriation of \$70,000 is also asked to aid the bureau in metallurgical research.

#### To Study War Developments

Because of the bureau's co-operation with automotive engineers it is interesting to note that an appropriation of \$250,000 is required for the next fiscal year for technical investigations in co-operation with the industries upon fundamental problems involved in industrial development following the war, with a view to assisting in the permanent establishment of the new American industries. It is also requested that \$25,000 be appropriated for the use of the Bureau to determine experimentally important physical constants.

For laboratory and field investigations of suitable methods of high-temperature measurements and control in various industrial processes and to assist in making

available directly to the industries the results of the bureau's investigations in this field, \$15,000 is the amount to be appropriated for 1922. For the promotion of studies in safety standards in the large industrial plants of the country and the formulation of codes the Bureau of Standards wants \$25,000. It also wants \$25,000 to inquire into specific and latent heats of metals and alloys, the electro-chemical equivalent of metals and the velocity of light.

#### Aeronautics Asks \$489,906

The National Advisory Committee on Aeronautics wants an appropriation of \$489,906 for the fiscal year of 1922. This sum will be used for scientific research, technical investigations, and special reports in the field of aeronautics, including the necessary laboratory and technical assistants; traveling expenses of members and employees; office supplies, printing and other miscellaneous expenses.

Because of the importance of developing foreign markets for automotive products, the industry has constantly advocated increases in the personnel of Government commercial attaches. The Secretary of Commerce has recommended that \$300,000 be appropriated for the promotion of commerce overseas. This figure represents a large increase as the appropriation of \$171,000 for the current fiscal year has proven inadequate. A supplemental appropriation of \$500,000 is asked to cover other phases of foreign trade promotion.

The Bureau of Public Roads contemplates an extension of its work next year as its estimates reflect large increases. An appropriation is asked for 1922 which will be used for inquiries in regard to systems of road management and economic studies of highway construction, operation, maintenance and value, either independently or in co-operation with other agencies and for giving expert advice on these subjects. The current appropriations amount to \$36,200. It is proposed to increase the salary of the bureau chief from \$5,000 to \$7,500. This increase is in line with similar recommendations of the Secretary of Agriculture for divisional officials.

#### Highway Laboratory, \$150,000

To supplement the \$75,000 appropriation now available for the construction of a laboratory building on the Arlington Farm property of the Department of Agriculture as permanent headquarters for the testing and research work of the Bureau of Public Roads, the amount of \$75,000 has been requested.

Fifty thousand dollars is required by the Bureau in investigations of the chemical and physical character of road materials, for conducting laboratory and field experiments, and for studies and investigations in road design, independently or in co-operation with State highway departments and other agencies for conducting field experiments and various methods of road construction and maintenance, and investigations concerning various road materials and preparations;

(Continued on next page)

## Exports of Engines Show Falling Off

### Airplane Exports and Gas Engines Gain—Car and Parts Imports Grow

WASHINGTON, Dec. 6.—Ten airplanes were shipped abroad in October, 1920, valued at \$147,600, as compared with three and a value of \$23,000 for the same month last year. A total of 56 planes valued at \$546,174 have been sent overseas during the first ten months of this year.

Though the total for ten months ending October exceeds the corresponding period last year, reports show a slump in the volume of exports of automobile engines. Only 496 engines of this type were exported as against 2,889 engines for October, 1919. Tractor engines also showed a decrease in volume of exports. The shipments for October, 1920, amounted to 1,584 engines valued at \$1,681,359 as against 1,748 tractor engines valued at \$1,528,673 for October, 1919.

The exports of stationary gas engines aggregated 2,844 engines valued at \$472,399 for October, 1920, as compared with 1,408 engines valued at \$245,213 during same month last year. The total number of gas engines shipped during October, 1920, amounted to 5,543 engines with a value of \$2,537,544, a decrease in numbers but an increase in valuation over the 6,861 engines, valued at \$2,422,528, sent abroad in October, 1919. The aggregate for ten months of this year shows 82,748 engines valued at \$30,535,634. For the same period last year it amounted to 74,608 engines with a value of \$28,789,165.

Imports of automobiles for October, 1920, totaled 41 cars valued at \$63,487 as compared with an importation of 21 cars for same month last year. For the ten months a remarkable increase is shown in statistics giving a total of 787 cars valued at \$858,397 for 1920, compared with 88 cars valued at \$43,727 last year. Parts, except tires, imported during ten months of this year amounted to \$1,028,992 while the imports for ten months of 1919 aggregated \$171,907. The value of \$93,077 for October, 1920, represents an increase of 300 per cent over the same period last year.

During October, 1920, 459 automobiles manufactured in this country were returned. The total returned for ten months of this year was 4,849 cars valued at \$7,718,372.

#### BRITISH FAIR DATES SET

NEW YORK, Dec. 6.—The British Industries Fair, regarded as the most important trade exposition conducted in Europe, will be held at London and Birmingham from Feb. 21 to March 4 and at Glasgow from Feb. 28 to March 11. Only British manufacturers will be permitted to exhibit. Admission will be only by invitation but cards may be obtained at the British consulate general in this city.

## Chrysler Production to Start in Spring

**Elizabeth Factory Completed at  
Cost of \$9,000,000—Position  
Considered Favorable**

NEW YORK, Dec. 6.—The Willys Corp. has issued a statement concerning the Chrysler Six automobile which says:

"Production of the Chrysler Six automobile, which may be regarded as the company's most important project, will begin in the spring of 1921. Factory at Elizabeth, N. J., is substantially completed and is being occupied. Total expenditure for this factory property will be about \$9,000,000 which approximates the company's original estimate.

"It is fortunate that production of the new car has been delayed. This is to the company's advantage because of the fact that it will come into production at a time more favorable both for the purchase of materials and sales to the public.

"Willys Corp. at the time of its formation in September, 1919, owned 500,000 shares of Willys-Overland common stock, or substantially one-third of the then issued common stock of the company. Last July Willys-Overland increased its capital and Willys corporation increased its holdings correspondingly to 730,000 shares, thereby maintaining its position of holder of one-third of the voting stock of Willys-Overland.

"This increased investment in Willys-Overland was made from surplus profits and from the sale of securities junior to the first preferred stock. Entire proceeds from the sale of Willys corporation first preferred stock have been devoted to the erection and equipment of the Elizabeth plant and for working capital as originally contemplated. Inventories and notes and accounts receivable have increased approximately \$6,600,000 to Sept. 1, 1920."

### ALLIS MAKES 12-20 TRACTOR

MILWAUKEE, Dec. 4.—A new three plow tractor with a 12-20 hp. rating is being brought out by the Allis-Chalmers Mfg. Co. It is geared for a low speed of 2½ m.p.h. and a high speed of 3¼ m.p.h. at 1100 r.p.m. of the engine. A drawbar pull of 2000 lb. on high gear is guaranteed. The belt pulley is 13 in. diameter and the belt speed, 2700 ft. p.m. The first sample of this model was shown at the Wisconsin State Fair but several minor changes will be incorporated in the production job. The price has been set at \$1,350.

### ORGANIZE AUTOMOBILE UNION

BOSTON, Dec. 4.—As part of a national campaign for the organization of an automobile department union, within the International Association of Machinists, but separate and distinct from the present locals of machinists, repair and railroad departments, E. P. McKenney,

general organizer for the international, has arrived in Boston to take up the work of establishing a Boston local union among the automobile men.

Up to the present time machinists and other workers in the automobile trades have been members of machinists' locals, which embraced workers in various trades outside the automobile industry. Machinists' work in the automobile industry, however, differs so widely from that of machinists in other lines of work that it was felt by the international body that they should have local unions distinctly their own.

## Automotive Studies to Cost \$1,800,000

(Continued from preceding page)

for investigating and developing equipment intended for the preparation and application of bituminous and other binders.

The Bureau wants \$77,300 appropriated for its use in a study of road making by the use of local materials and for the investigations of the best methods of road making, especially ordinary sand-clay and dirt roads, and the best kinds of road-making materials, by the use of local materials; for studying the types of mechanical plants and appliances used for road building and maintenance; for studying methods of road repair and maintenance suited to the needs of different localities; and for furnishing expert advice on road building and maintenance.

The Bureau of Mines evidently intends to extend its research and conservation movement as to fuels for they have asked for \$453,840 which will be devoted to inquiries and investigations concerning the mining, preparation, treatment, and utilization of petroleum and natural gas, with a view to economic development and conserving resources through the prevention of waste; to inquire into the economic conditions affecting the industry.

An additional \$175,531 is wanted for investigation of mineral fuels and unfinished mineral products belonging to or for the use of the United States with a view to their most efficient mining, preparation, treatment, and use, and to recommend to various departments such changes in selection and use of fuel as may result in greater economy.

### \$100,000 Asked for Road Study

As the organizations in the industry interested in the promotion of highway education expect the Bureau of Education to take an active part in the movement it is significant to note that an appropriation of \$100,000 is asked for the investigation and development of methods of educational extension through cooperation with State departments of education, universities and colleges, and other public educational agencies in the States; the preparation and circulation of material for class instruction, correspondence instruction, and visual instruction; the promotion of community organization and public discussion.

## Receiver Appointed for L. W. F. Company

**Failure of Government to Enact  
Air Program Blamed for  
Difficulties**

NEW YORK, Dec. 6.—Failure of the Government to evolve and put into effect a definite aeronautical policy or program is blamed for the financial difficulties of the L. W. F. Engineering Co. of College Point, said to operate the largest aircraft manufacturing plant in the United States, which has been placed in the hands of Ernest Whitbeck as receiver. The company is said to be entirely solvent, but is cramped for funds to meet current obligations because of troubles similar to those which have confronted many other companies. It is believed its affairs can be straightened out under a receivership.

The receivership is held to be a direct outcome of the policy of other nations to develop their own aviation at the expense of the United States. The plan first became apparent when Handley Page, Ltd., of England, began the dumping here of surplus aircraft which it had purchased from the British Government for a fraction of its cost.

The second blow at the industry in America, and a more telling one than the dumping here of antiquated machines, was the attempt of German manufacturers to penetrate the American markets. This came with the purchase by the Postoffice Department, without adequate tests, of all metal Junker planes, which were hailed as a revolution in aircraft manufacture. These planes have not been successful in practice.

The L. W. F. company was organized in 1915 with a capital of \$1,000,000. At the time of the armistice it employed 2200 persons. It was the originator in this country of the laminated wood fuselage and it built the plane which was the first to fly with a Liberty engine. Its plant covers five city blocks.

The receivership came almost simultaneously with the annual report of Major General Charles T. Menoher, chief of the air service, in which he said that "unless the Government aids the airplane industry, it cannot hope to depend upon the availability of suitable commercial aircraft and facilities for their employment, nor upon the existence of manufacturing plants and supplies of materials necessary for the rapid production of aircraft in time of war."

### P. & J. TO BUILD EQUIPMENT

MILWAUKEE, Dec. 6.—A charter has been granted to the P. & J. Motor Co. of Cudahy, a suburb of Milwaukee, which is incorporated with an authorized capital stock of \$250,000 to manufacture and sell gas engines, automotive parts and equipment and metal products of all kinds. The incorporators are represented by James S. Guy and Charles B. Charles, attorney, Milwaukee.

## Industry Prepares for Trade Return

### Factories Outline Larger Schedules — Promises of New Business Assume Definite Form

(Continued from page 1186)

a full shut down, Nov. 15, but that plan was altered and the factory did not resume until Nov. 25. Various departments of the factory will be opened gradually with the idea of getting the plant into full production Jan. 1.

Hup, which had been working to capacity through the first two months of the period of depression and which went down from around 95 a day to 10, Oct. 1, started on a schedule of 25 daily, Nov. 15, and is maintaining that program.

President Hastings said reports from all section of the country indicated improved conditions and renewed confidence and expressed the opinion that a steady increase in sales would be apparent soon after Jan. 11, reaching normal around April 15.

Dodge Bros., after a record breaking performance during October and part of September, went into a two-day a week schedule three weeks ago and has outlined a program that will be continued indefinitely, which, according to unofficial reports from the plant, calls for a production of 200 cars a day, about one-third the normal output. The regular roster of Dodge employees contains about 24,000 names, but the plan, it is said, will be to continue operations with the force cut to about 5000 men.

President Percy Owen of Liberty declared this week the company had received more orders Monday and Tuesday than for any two days in several months, indicating improved conditions that presaged a steady increase until normal conditions had been restored. Liberty dealers, Owen said, were optimistic and were enthusiastic over the apparent improvement and indications that the crest of the slump had been reached and passed.

#### Columbia Ready to Start

The same report was made by officials of Columbia Motor Co. Columbia, like Liberty, practically has been producing no cars for several weeks but, according to W. L. Daly, general sales manager, the readjustment period has been utilized in reforming sales organizations and reshaping merchandizing policy in preparation for a resumption of demand, indicated in more cheerful reports from dealers, particularly in the West and Southwest.

Packard Motor Car Co. is continuing its efforts with the new single Six, but production on the Twin-Six virtually has ceased for a time. The normal output at the Packard plant is 750 a month, but that schedule has been cut more than half and while no definite figures can be secured unofficial but authentic information is to the effect that Packard output

is running around 300 a month with truck production cut to a point where it is dependent solely on orders.

Paige continues full time operation with reduced working force, and is producing on a schedule of about 800 a month. Paige officials are hopeful of quick resumption of buying and base that feeling on reports made by company officials who have toured the greater part of the country. Much of the Paige production is distributed in the West.

The Chevrolet plant at Flint still is operating on the 85 a day schedule, according to Sales Manager C. E. Dawson, though he admits the factory under present conditions has not reached that production point. Normal production at Chevrolet, as based on last spring, is about 550 a day. The motor and axle division still is down at Chevrolet, decreasing the employee force about 1500 but it is planned to resume operations in those departments Dec. 15.

## M. A. M. A. Directors See Brighter Turn

NEW YORK, Dec. 7—A more optimistic feeling concerning the future of the automotive industry than has been apparent for some time, was manifest at the monthly meeting of the directors of the Motor and Accessory Manufacturers' Association held here last Thursday. They appeared convinced that a turn for the better in business will come with the new year.

It was reported that many makers of parts and accessories are receiving substantial orders for deliveries running from the present to the last of March and it was said many additional orders are in prospect. The parts makers do not propose to be unprepared for the resumption of business which they confidently expect. For that reason, they are making plans now for replenishing their stocks of raw material and are getting their organizations in a position to start production on a large scale when the turn for better really begins.

The parts men realize fully that unless ample provision is made for the future business now in prospect, there may be a repetition on a small scale of the conditions which prevailed last spring when manufacturers were bidding against each other for supplies. They propose to make unnecessary any period of stagnation in the industry through inability on the part of car makers to obtain materials for complete vehicles.

#### ALLEN DEFERS ACTION

COLUMBUS, Dec. 7—Stockholders and creditors of the Allen Motor Co. have decided to make no attempt at present to lift the receivership because of the unsettled conditions in the business world. William C. Willard and George A. Archer will continue as receivers. The company has been successful under the receivership and it is expected the stockholders will take it out of the hands of the court as soon as general conditions become more satisfactory.

## Templar Decision Benefits Industry

### Stock Depressing Activities Regarded as Checked—Stock Exchange Condemns Practice

NEW YORK, Dec. 6—Templar Motors Co. of Cleveland is taking full advantage of the decision of Judge Levine in the Court of Common Pleas in refusing to grant a receiver upon application of a minority stockholder. The court scathingly rebuked J. W. Wilson, who brought the action, for making the "grossest kind of accusations against a perfectly solvent firm for the purpose of creating suspicion in the minds of the public concerning its affairs."

The Templar company is running large display advertisements in which it asserts that "American business and American institutions must be protected from the unscrupulous attacks of irresponsible people."

"The application for receivership against the Templar Motors Co. and the findings of the court in this matter," it said, "proving the company to be absolutely sound and solvent, have a deeper significance than a single victory by a single organization. It is rather a victory for American business and American institutions."

The decision in the Templar case followed closely a warning issued by William H. Remick, president of the New York Stock Exchange denouncing rumor-mongers. He warns the members that circulation of sensational rumors will be deemed an act detrimental to the welfare of the exchange and its members and points out that there is a state law which calls for the punishment of individuals responsible for the circulation of rumors likely to depress security prices.

The automotive industry has suffered as much as any other from the circulation by professional stock gamblers of reports designed to bring down the prices of stocks so they could sell short to their own selfish advantage.

#### IMMEL PLANT CLOSED

COLUMBUS, Dec. 4—Robert H. Schryver, receiver for the Immel Co., body manufacturers of Columbus, which has been operated on orders booked from automobile factories, announces that the plant has been closed down indefinitely as a result of cancellation of orders. Some of the automobile concerns have asked that shipments be held up. The plant employed about one hundred men.

#### MUNDIE ADOPTS NEW ENGINE

PERU, ILL., Dec. 4—The Mundie Mfg. Co. has adopted the Climax model T, 5½ x 7 in. engine as standard power equipment for their No. 8 10 x 10 in. "Zin-Ho" compressor. This company has used the model K, 5 x 6½ in. Climax engine for several years in connection with three of its smaller size outfits.

# Earl Resigns From Willys-Overland

## Change in Policies Thought Responsible

### Retirement of Vice-President Causes Wide Comment—C. B. Wilson Is Successor

TOLEDO, Dec. 7—Wide comment has been caused in the automotive industry by the resignation of Clarence A. Earl as first vice-president of the Willys-Overland Co. and virtual head of the corporation's interests in this city. He has been succeeded by Charles B. Wilson, president of the Wilson Foundry & Machine Co., Pontiac, Mich., a Willys subsidiary.

Earl was emphatic to-day in his refusal to make a statement governing the reasons for his resignation or to discuss organization affairs. It is known, however, that there have been sharp differences of opinion for the last year on matters of policy but it was supposed Earl was firmly entrenched.

It is regarded as significant that these differences of opinion seem to have grown irreconcilable since conditions arose which put the bank interests in the company in a position to dictate. It was these same interests which made Walter P. Chrysler, executive vice-president of the Willys company, chairman of the Maxwell-Chalmers reorganization, with J. R. Harbeck vice-president of the American Can Co. and also a director in many of the Willys companies, as vice-chairman.

The retirement of Earl was forecast by the recent resignation of officers and department heads who had grown up in the Earl organization and were loyal to him. It became evident some time ago that Earl expected to leave Toledo soon when his residence there was offered for sale. The home of John N. Willys was placed on the market at the same time. It is generally expected here that the affairs of Willys-Overland will be centralized in New York from now on to a greater extent than before.

#### Important Factor in Growth

It has been recognized everywhere in the industry that Earl is not only a production man of the first rank but a manufacturing executive of high rank. The progress of Overland in the last five years is regarded as a tribute to his ability. He joined the Willys organization after a successful career with the Hendee Mfg. Co., assuming the position of first vice-president in charge of manufacturing.

Events which developed soon after his entrance into the organization forced upon him duties outside this particular

field and his ability to become master of difficult situations quickly resulted in his becoming the nominal head of the Willys interests with general supervision over all matters save financing and policy.

When Earl went with Willys-Overland he found eighteen chassis and thirty models comprising the company's product. In resigning he leaves only two models, both of which have gained wide popularity in their particular fields. His success in handling the strike of 1918, which would have been a blow at the entire industry if it had been successful, brought him prominently before the country. That year the company showed a profit of approximately \$3,000,000 in spite of the labor difficulties which continued for eight months.

#### Half Year Business Broke Record

It also is regarded as significant of his ability that for the first six months of this year the company made more money than in any similar period in its history. A continuation of this showing was made impossible by the present period of depression.

Although the duties of Earl originally were confined to manufacturing it devolved on him to take the lead in building up a dealer organization and this organization to-day is admittedly one of the strongest in the country. He already has received hundreds of telegrams from dealers expressing regret.

Wilson, the new executive vice-president, took up his duties Monday but declared he could not say when the factory would resume production for the reason that he had not had time to familiarize himself with conditions. About 2,000 men are at work in the parts department which has been operated uninterruptedly except for a few days during which inventory was taken.

Wilson is highly regarded as an executive and is known as a close friend of Chrysler. While he succeeds Earl, it is believed his duties will be confined to production. He joined the Olds Motor works in 1898 and later went with the Ferro Foundry & Machine Co. He left that concern in 1914 to organize the Wilson Foundry & Machine Co. He will continue as president of the foundry company but the active management will be turned over to D. R. Wilson, his brother, now vice-president and sales manager.

#### No Statement at Headquarters

NEW YORK, Dec. 7—Information as to the reasons for the resignation of Clarence A. Earl as first vice-president of Willys-Overland was refused to-day at the Willys headquarters here. The only statement issued was a brief announcement signed by John N. Willys stating that Earl had resigned and that Charles B. Wilson had been named as his successor.

## Schwab Not Buying Control of Stutz

### Visit to Plant Not with Purchase in View—Thompson Denies Impending Changes

NEW YORK, Dec. 6—Reports that Charles M. Schwab has taken over the stock of the Stutz Motor Car Co. of America controlled by Allan A. Ryan are formally denied by the head of the Bethlehem Steel Corp. They probably originated, Schwab said, from the fact that he made a flying visit to the Indianapolis factory with Ryan but, he added, "the visit was made with no such object as purchase in view."

No announcement concerning any change in the status of Stutz affairs was made after a special meeting of the directors here late last week. Alvin Untermyer was elected a director and the regular quarterly dividend of \$1.25 a share was declared. Untermyer is a son of Samuel Untermyer, the famous attorney who has been retained by Ryan to look after his interests in the controversy with a bankers committee organized to take over his affairs as a measure of protection on loans.

William N. Thompson, president of the Stutz company, who came on here to attend the directors' meeting, issued a statement in which he said that the company was in a prosperous condition and that rumors of a change in control were without foundation.

"The vicious inspired rumors which are being circulated of an impending change in control of Stutz Motor Car Co. of America," said Thompson, "are baseless. The present management in control of the company will not be changed."

"The company is in a particularly prosperous condition and its management most satisfactory to the owners. It owes practically no money; has no fixed or other charges and has millions in free current assets."

## F. A. Seaman Elected Springfield Tire Head

NEW YORK, Dec. 7—F. A. Seaman, vice-president and secretary of the Kelly-Springfield Tire & Rubber Co., was elected president at the directors' meeting to-day to succeed Van H. Cartmell, who retired because of ill health and advanced age.

Arthur Sachs of Goldman, Sachs & Co., was elected a director.

A quarterly dividend of \$1.50 a share on the 6 per cent preferred stock of the company was declared and will be paid Jan. 1.

## British Plane Sale Enjoined by Court

### Wrights Get Decision in Anti-Dumping Action—Patents Not Questioned

NEW YORK, Dec. 7—Federal Judge Julius Mayer has granted to the Wright Aeronautical Corporation a preliminary injunction against Handley-Page, Ltd., and the Aircraft Disposal Company, Ltd., two English corporations, and William H. Workman, their representative in the United States, restraining them from bringing to this country and selling here surplus British war planes, engines and spare parts, said to have cost \$500,000,000. In aeronautical manufacturing circles the decision was hailed as a partial victory in the anti-dumping fight.

In his decision Judge Mayer said:

"The Wright patent has been adjudicated to be valid and a pioneer of wide scope by Judge Learned Hand. . . .

"The defendants do not question these facts nor deny title, validity or infringement, but put forward the argument that the introduction of these machines will educate the American public to the utility of the airplane as a commercial proposition, hence create a large demand, hence ultimately stimulate American industry to supply that demand.

"The American manufacturer may, however, be trusted to make up his mind as to what is best for him, and his bitter opposition shows that he considers that if these machines are brought here and, as defendant Workman states, are laid down, duty and heavy transportation charges paid, in New York City—or, in fact, anywhere in the United States—at a price which is but a fraction of their actual value, such importation will destroy or gravely impair American industry in this regard.

"Defendants acquired these planes from the British Government with their eyes wide open and took their chances on their legal rights. They state that they have allotted 2,365 planes for the American market. The selling price of these planes is said to be \$6,510,000, and the defendants assert that the expense of storage and other incidentals are mounting high, and if a preliminary injunction goes against them they will lose the market and suffer great loss.

"Yet, this was their hazard. They should have known that plaintiff would move expeditiously and diligently, as it has. There are, then, no equities in favor of defendants, and they must rely on their legal rights."

## Harper-Bean Subsidiary in Receivership

NEW YORK, Dec. 8—A cable despatch from London announces that a receiver has been appointed for Harper Brothers & Bean, a subsidiary of Harper-Bean, Ltd., which was formed a year ago for the manufacture of motor cars with a capital of £6,000,000.

## AIRPLANES BELIEVED SMUGGLING WHISKEY

WILMINGTON, DEL., Dec. 6—Airships, according to information received here, are being used, presumably in the transportation of liquor from one part of the country to another. Besides smuggling liquor across the Canadian border, it is said that the "whiskey ring" of Chicago has adopted the same method to distribute the stuff.

The report is believed here, in view of the fact that motor liquor trains, which came through frequently have almost entirely disappeared in this locality, except where they are carrying the stuff under legitimate permits. Now it is believed they are carrying the liquor through the air, out of the vision and reach of the officers. If this proves to be a fact, it may be necessary for the Government to send out sky police to regulate the traffic.

## Territorial Limits Abolished by Ford

DETROIT, Dec. 7—Ford dealers in many sections of the country are concerned over the action of the company in abolishing territorial restrictions on the sale of Ford products, particularly in small cities and towns. While it is denied by officials of the company, there are well authenticated reports of vigorous protests being entered against the order issued last week by General Sales Manager Ryan under which it will be permissible for any dealer to solicit and sell in any territory without regard to other dealers.

Heretofore each dealer has been assigned a specific territory and protected with a commission on any car, truck or tractor sold in that territory. Territorial limits were fixed by the factory and usually were based on population although no hard and fast rule was applied. Country dealers usually were given entire counties with exclusive rights; dealers in large cities were given defined areas with full protection.

## CREDITORS SUE MIDWEST

DAVENPORT, IOWA, Dec. 6—Half a dozen manufacturing and jobbing firms have filed suits against the Midwest Motor Corp. for claims aggregating \$1,200. Chief of the creditors is the Barcy-Nicholson Co., whose bills total \$414. Others are the Maremount Mfg. Co., Myles-Standish Mfg. Co., Victor Mfg. & Gasket Co., Western Felt Works and the Lockwood-Ask Motors.

## ADVANCE-RUMELY TRUCK

In a recent issue we printed the specifications of the new truck of the Advance-Rumely Thresher Co., Inc. These should have included Blood Bros., universal joints.

## Fort Wayne Tire Defends Integrity

### Warns Stockholders of Attempt To Weaken Company—To Increase Director Board

FORT WAYNE, IND., Dec. 6—Information concerning the fact that the United States Court, sitting in Indianapolis, removed the receiver appointed by the Allen County Circuit Court of this city for the Fort Wayne Tire & Rubber Mfg. Co. is contained in a "Warning" prominently published by the company in local newspapers. The "Warning" also contains some other information relative to the company. The whole advertisement is as follows:

"This company has been informed that individuals are writing to stockholders advising them that its assets have been placed in the hands of a receiver and will soon be sold at a receiver's sale and that because of this fact at a meeting of stockholders it was determined to organize another company under the name of 'Fort Wayne Rubber Works' with a capital stock of one million dollars, \$750,000 common stock and \$250,000 preferred stock, divided into shares of \$10 each.

"This is to advise all stockholders that the receiver appointed by the Allen Circuit Court of Allen County, Indiana, was, on motion of the company, removed by the United States Court, sitting in Indianapolis, on the ground that the appointment of the receiver was improvidently made and the property was returned to the company. The representations made in the circular sent out are an attempt on the part of those who have been attempting to wreck this company, to further embarrass it, if possible.

"We further advise our stockholders that the company is in possession of its property and will operate the same and will call a special meeting of the stockholders for the purpose among others, of fully advising each and every stockholder of the exact condition and situation.

## Officers Not To Vote

"Steps have been taken to increase the board of directors from five to eleven members and a special stockholders' meeting will be called for the purpose of electing the additional six directors. J. C. Brown, the company's president, and L. R. Kraft, its secretary, have voluntarily agreed that the United States District Court might enjoin them from voting their own stock at this stockholders' meeting or making any effort of any kind or character to influence or control the selection of the six new directors.

"We urgently request that each stockholder be present, if possible, at this special meeting of the stockholders and that if he cannot attend the meeting, that he so place his proxy that his stock will be voted at such meeting for such directors as, in his independent judgment, will promote and conserve the best interests of the company."

## Ericsson Creditors Prepare Objections

### Will Seek to Compel Company to Answer Petition—Urge Reorganization

NEW YORK, Dec. 9—The committee representing merchandise creditors of the Ericsson Mfg. Co. of Buffalo, headed by W. R. Nones, has called a general meeting of all creditors at Buffalo today to take up the affairs of the company in detail and decided upon a course of action for the future. Pending the working out of this plan and to protect the unsecured creditors, Sidney S. Meyers, general counsel of the Motor and Accessory Manufacturers' Association, appeared before Federal Judge Hazel in Buffalo and obtained a stay of twenty days within which to present answers to the involuntary petition in bankruptcy filed against the corporation.

The committee and Meyers have had conferences with the receivers, the stockholders, the bank creditors, lawyers and others at which they have studied the financial and business affairs of the Ericsson company with great care. This investigation has convinced them of the following facts in relation to it:

"That the company is apparently solvent.

"That the petition in involuntary bankruptcy (made by three creditors whose total claims aggregate about \$3,000) should be answered and stopped, although both the stockholders and the receivers have stated that they do not intend to file any answer.

"That the business and financial reorganization of the company is apparently warranted by the results of the investigation, which will presumably be verified by the facts when completely known.

"That earnest constructive operation of the company's plant and business by the Receivers in Equity is essential pending the development of reorganization plans.

"The co-ordinate and consolidated action by all the unsecured creditors is absolutely necessary to conserve and to protect the property and the creditors.

"That failure to act at this time will jeopardize the business and the good will of the company and will seriously hurt the interests of unsecured merchandise creditors."

The committee which represents a large majority in amount of the merchandise claims has urged a large attendance at the meeting and points out that unless concerted action is taken immediately the creditors are likely to suffer a severe shrinkage in the value of their claims.

### ACME MAKES SPEED TRUCK

CADILLAC, MICH., Dec. 6—A new  $\frac{3}{4}$ -ton speed truck assembled from well-known units is announced by the Acme Motor Truck Co. This truck is designed to meet the growing demand for light-weight delivery trucks. It is equipped with a Continental 35 hp. engine, Cotta transmission and Timken axles, and is said to be capable of a speed of 30 m.p.h. The truck uses a worm drive semi-float-

ing axle with 6 to 1 reduction, and is not in any sense a passenger car chassis converted for truck use. The frame is of pressed steel, 4 $\frac{1}{2}$  in. deep. Two universal joints with hollow drive shaft are fitted. Torque and drive are taken through the springs, which are 2 $\frac{1}{2}$  in. wide by 52 in. long in rear, and 35 in. long in front. The wheels are of the steel disk type and carry 34 x 5 in. cord tires. Electric lights and generator are included in the equipment. In appearance the truck resembles the Acme one-ton model, having the same radiator, hood, cowl and seat, and taking the same windshield and cab. The price of chassis is \$1,790 f.o.b. factory.

### Du Pont Prepares to Assume New Duties

NEW YORK, Dec. 7—No announcement has been made as yet of any change in policy in the management of the General Motors Corp. under the direction of Pierre S. du Pont, who succeeded W. C. Durant as president last week. Du Pont is arranging his many other interests so that he can devote most of his time to the automotive industry, but thus far has spent only one complete day in the offices of General Motors. He is thoroughly familiar with the corporation's business in its larger aspects, but now is familiarizing himself with the details which his new position will compel him to take up. In this he will be assisted by the former president.

Durant has opened temporary offices in a Broadway building across the street from General Motors headquarters and will occupy permanent offices in the new building of the Gotham National Bank when it is completed early in the year. Durant and his family have gone South where he will rest for a fortnight longer before returning to New York. So far as can be learned, he has made no definite plans for the future and probably will not do so for the next three months. It can be said, however, that he still has large interests in General Motors and is not likely to divorce himself entirely from the affairs of that organization for some time to come.

### CLARK AXLE IN PRODUCTION

BUCHANAN, MICH., Dec. 6—A motor bus axle of the internal gear type has been placed in production by the Clark Equipment Co. The first model is that for a single deck, 20-30 passenger motor bus, to be equipped with solid or pneumatic tires. All models of this bus axle will use stock parts. The design of this axle is said to provide for a low body with a minimum number of steps, insuring a low center of gravity.

### BERGOUGNAN PRICES DROP

TRENTON, N. J., Dec. 3—Prices on Bergougnan fabric and cord tires have been reduced effective Dec. 1. On fabrics the cut ranges from 8 to 15 per cent, and on cords from 10 to 12 $\frac{1}{2}$  per cent, according to size. No reductions are made in inner tubes.

## Dyneto Operating on Limited Basis

### Ascribes Difficulties to Slump in Farm Light Business— Position Sound

SYRACUSE, Dec. 4—The situation in the affairs of The Dyneto Co. where a creditors' committee recently was appointed by an order of United States Court, is not directly to be attributed to the slump in the automobile business, although a fair share of the company's business has been with the Franklin Automobile Co.

The complete cessation of selling of farm lighting outfits, in September, coupled with the fact that Franklin and other automobile manufacturers refused shipments at about the same time left the Dyneto company with a great surplus of stock on hand; no immediate possibility of shipment and a practically impossible collection market.

The Dyneto plant is operating, and is making limited shipments. The financial situation, according to J. D. Grant, vice-president of the company, is fundamentally substantial.

"Our affairs are not in precarious condition," Grant said. "The committee was asked for merely because we are over-inventoried. We have been doing a tremendous business here both in our automobile starter and farm lighting departments. The automobile situation broke in August but we continued with the farm light units. In September that broke even worse than the automobile situation. Since then we have been trying to effect an adjustment.

"Collections were impossible and it was useless to make shipments. As a result we held up all payments and have brought our creditors' committee into close touch with our entire situation. We have every reason to believe that our situation will return to normal within the near future."

Mr. Grant denied that the fact that Franklin had reduced prices affected the situation materially. "The Franklin company has asked us to endeavor to reduce the cost of our starters, and we are trying to do so. We are making starters for all Franklin cars now."

### TO MAKE AIR-COOLED CAR

DAYTON, OHIO, Dec. 6—Research Engineering Co., incorporated about a year ago, will bring out a new air-cooled car, the engine and engineering features of which were invented and designed by O. H. Spencer, who is president of the company. Capital stock has been set at \$200,000 and a factory site is to be bought here. The building of trucks will be added later, according to plans.

### ROBERT BOSCH AGENTS NAMED

NEW YORK, Dec. 4—Mazzoli & Schendel, Inc., of this city, have secured the sole selling rights for the Robert Bosch spark plugs in America.

## Duryea Gets Place in National Museum

**Car Built in 1892-93 Placed on  
Exhibition—Won Chicago  
Race in 1895**

WASHINGTON, Dec. 7—The second gasoline automobile designed and built by Charles E. Duryea between September, 1892, and September, 1893, has been rescued from oblivion in a barn at Springfield, Mass., where it had been stored for years, and placed on exhibition in the Smithsonian Institution here. It is in good condition except for minor damage caused by rain and snow which leaked through the roof of the old barn.

The car is a duplicate of the first gasoline automobile, which was designed and built by Duryea between August, 1891, and September, 1892, except that it has a more powerful engine and correspondingly heavier and stronger parts. The car is a converted horse-drawn carriage of phaeton style.

The essential parts of the car remain very much the same as when first built. Easily loosened brass parts are gone, as is the floor carpet and cushions, the steering handle, wires, etc. Many parts are badly rusted from exposure, but the wheels and steering gear worked without hitch as the car was drawn from the freight station to the museum.

Twenty-five years ago—Thanksgiving Day, 1895—the car won the Chicago road race for motor vehicles held under the auspices of the Chicago Times-Herald. Sixty cars were entered but owing to lack of time to complete the models and the snow covered course, only six started. Two finished, the Duryea, and a Benz car entered by the Mueller Mfg. Co., Decatur, Ill.

Later the Duryea carriage was exhibited in P. T. Barnum's circus. The actual running time of the car for the fifty-five mile course was seven and a half hours, or about 7½ m. p. h. With delays for repairs which included a broken steering knuckle, the time consumed in covering the course was 10 hours, 28 minutes. The steering knuckle, was repaired at a blacksmith shop near the route.

Other entries in the race were a Benz by the De La Vergne Refrigerator Machine Co., a Roger wagon by R. H. Macy & Co., and electric wagon by Harold Sturgess, and an electrobat by Morris & Salom. Duryea had hoped to complete one of his improved models for the race, but failing to do this entered this second car of his, which up to that time, had been run several thousand miles experimentally.

### INSURANCE COMPANIES UNITE

CHICAGO, Dec. 6—The National Association of Automotive Mutual Insurance Companies, made up of mutual casualty companies from all sections of the country writing one or more forms of automobile coverage, has been organized

at Chicago. One of the prime objects of the organization is to co-operate with other insurers and all available agencies in the formulation of uniform legislation for the registration of automobiles and uniform laws to prevent the theft of automobiles.

The organization will furnish its members with information regarding proposed and pending legislation affecting their business, and will advise them as to State and Federal fees and taxes, and also furnish other information of interest to companies writing automobile insurance.

### Exchange May Probe Raid on Pierce-Arrow

NEW YORK, Dec. 9—Governors of the Stock Exchange are considering today a rigid investigation of a vicious bear raid yesterday on the stock of the Pierce-Arrow Motor Car Co. While the raid was in progress constructive traders declared it was time to make effective the recent warning that practices of this kind would be punished.

The only basis for the attack on the stock was an unconfirmed report that the dividend would be passed. On offerings of only about 2,000 shares there was a break at one time of 18 points and the stock closed with a net loss of 9½ points. It opened at 76 and sold down to 59, from which it rose to 68.

Pierce-Arrow officials were amazed at the assault on the stock and declared there was no basis for it. The company is in excellent position and the earnings will far more than cover the preferred dividends, with six months' business on the books.

This is not the first time in recent weeks that Pierce-Arrow has been the target for unscrupulous traders who have hammered down its stock.

### NATIONAL TO INCREASE STOCK

NEW YORK, Dec. 9—Stockholders of the National Motor Car and Vehicle Corp. of Indianapolis, at a special meeting here yesterday, ratified a proposal of the directors that the capital stock be increased from 80,000 shares to 150,000 shares, of which 140,000 shares will be common of no par value and 10,000 of 8 per cent cumulative preferred of \$100 par value. The preferred stock will be sold to provide additional working capital. No further announcement was made concerning the company's plans for refinancing.

### TRUCKS URGED FOR RAILROADS

WASHINGTON, Dec. 9—In an address yesterday before the National Rivers and Harbors Congress, co-ordination of highways, railways and inland waterways in the interests of efficiency and economy was urged by C. H. Markham, president of the Illinois Central Railroad. He pointed out that the essentiality of the motor truck, as a means of transportation had been recognized and suggested that railroads own and operate fleets of trucks as supplemental to rail carriers at terminals.

## Overland Directors to Act on Dividend

**Lack of Quorum Causes Delay—  
Banks to Carry Loans Until  
Spring**

NEW YORK, Dec. 8—Directors of the Willys-Overland Co. undoubtedly will meet late this week and decide to pass the 1¼ per cent dividend now due on the preferred stock. The quarterly dividend of 25 cents a share on the common was paid in October but it is not expected in January. A meeting of the directors for dividend action was called for Monday but there was no quorum present and another meeting will be called within a few days, probably this week.

Willys-Overland stockholders will not fare as well as those who own securities in the Willys Corp. for the directors of that company decided to pay in scrip the preferred dividend due Dec. 1. This was done to conserve cash assets. It is understood that the Willys Corp. is in a better position in relation to current assets than is Willys-Overland in which it owns a one-third interest. Frozen credits are the principal difficulty with Overland although there has been a severe shrinkage in its earnings because of present conditions.

The Willys-Overland Co. has a large sum outstanding in bank loans but the total is not as large as has been reported in financial circles and it is understood the banks will permit the company to carry these obligations until early next year.

Semi-official announcement was made a short time ago that the Willys-Overland Co. was seeking new financing to the amount of \$30,000,000 but the plan was abandoned after it was set in motion. It can be said on authority that there will be no financing while the market conditions remain as they are now but it is regarded as certain that permanent refinancing will be undertaken in the spring or as soon as conditions warrant. In these negotiations the management of the company will co-operate with a strong banking group with which it has close affiliations.

Expectations that the dividend would be passed resulted in a spectacular decline in Willys-Overland stock. The common dropped to 5¼ and there were unconfirmed reports that banking interests recently took over at \$3 a share the holdings of a prominent stock market operator.

### TO BUILD NEW OHIO CAR

WARREN, OHIO, Dec. 3—Announcement of a new corporation to build the "Western Reserve" automobile was made here this week. The personnel of the organization was not made known. The product will be a passenger car using a motor manufactured by the company. All other parts, it is reported, are made in northeastern Ohio, the territory known in Ohio history as the "western reserve."

## Harvester Company Cuts Truck Output

### Cancellations Cause Countermanding Order Which Was to Have Increased Production

AKRON, Dec. 4.—The International Harvester Co.'s motor truck factory has rescinded an order to increase production 20 per cent made two weeks ago and substituted another calling for a reduction in production amounting to 25 per cent below the amount which has been in effect for some time. At the office of the plant it was stated that the order to increase was countermanded and the order to decrease issued by Cyrus McCormick, Jr. of Chicago on his visit to the Akron plant a few days ago.

In this connection it was also stated, and notices to this effect have just been posted in the factory, that the night shifts have been abolished throwing out of employment 250 hands. All over-time has also been cut out and the plan of paying a bonus for good attendance has been discontinued. The plant had 2,800 names on the payroll a week ago and it is feared by some of the heads of the plant that unless a change for the better is evidenced soon the force will be cut to 2000 or less before long.

In explanation of the reason for countermanding the order for an increase in production and ordering a decrease, it was stated that orders for motor trucks which had been booked are being cancelled at a rate sufficient to warrant the new order. The plant can turn out 100 trucks a day, and less than 50 are now being made.

## Harvester to Make Light Speed Truck

SPRINGFIELD, O., Dec. 4.—By the first of the year the Springfield works of the International Harvester Co. will begin the manufacture of a new type of light speed motor truck, according to announcement made at the local plant. Since the company sold its agricultural implement line here to the B. F. Avery Co., it has been devoting its energies to remodeling the big works at Lagonda, a suburb of Springfield, for the manufacture of motor trucks.

Charles H. Smart, of Milwaukee, is the new superintendent of the works. Every department of the plant is being operated now with a good sized force of men and more are being added. For the past few years the Springfield works has been making bodies for the Akron motor truck works.

### RUSH FORT WAYNE PLANT

FORT WAYNE, IND., Dec. 6.—Representing Cyrus W. McCormick, Jr., president of the International Harvester Company, James D. McCann has come to Fort Wayne to superintend construction work on the big motor truck plant which the company is building in this city.

Marked headway is being made on the construction of the new factory. Temporary sidings have been laid and much building material is now on the 140 acre plant site east of the city. Large cranes to be used in the building operations have also arrived. Preparations have been made to carry on the work during the winter. The first unit of the plant will be rushed to completion so that it may be in operation early next summer.

## Standards Committee Re-elects Officers

NEW YORK, Dec. 7.—At the annual meeting of the American engineering Standards Committee, Dec. 4, A. A. Stevenson, a representative of the American Society for Testing Materials, was re-elected chairman for 1921, and George C. Stone, a representative of the American Institute of Mining and Metallurgical Engineers, was re-elected vice-chairman.

The committee has recently been enlarged by the representatives of four additional member-bodies, as follows:

- U. S. Department of Agriculture:  
T. H. MacDonald, Chief, Bureau of Public Roads.
- U. S. Department of Interior:  
O. P. Hood, Chief Mechanical Engineer, Bureau of Mines.
- Gas Group, consisting of:  
American Gas Association.  
Compressed Gas Manufacturers' Association.
- International Acetylene Association.  
A. Cressy Morrison, Vice-President, Compressed Gas Manufacturers' Association.
- American Electric Railway Association:  
(Official representative not yet designated.)

There are now forty-seven members of the committee, representing seventeen member-bodies. Twenty-four organizations in all are represented on the committee, as three of the member-bodies are groups of organizations.

### ENGINEERS' CLUB TO EXPAND

BALTIMORE, Dec. 4.—A drive for increased membership—500 is the number aimed at—has been inaugurated by the Engineers Club. To induce students to join and keep young blood in the club a special low membership fee has been fixed for junior membership. New headquarters have been established in the Merchants and Manufacturers Building. Among the objects of the club are to provide an opportunity for engineers and technical men to meet each other in pleasant surroundings at centrally located club rooms, which will be open day and night, and to provide technical library facilities.

### DETROIT ADDRESSES CHANGE

DETROIT, Dec. 4.—All concerns doing business in Detroit should immediately get the new street numbers of their correspondents. The new numbers go into effect on Jan. 1 and embrace many of the business as well as the residential areas of the city. Delays of two to three days will be caused in the delivery of mail by using the old numbers after the first of January.

## METAL MARKETS

It is one of the anomalies of all commodity markets, but more strikingly true of the metal markets, that long before a general downward movement, such as has been recently witnessed, has run its full course, there are discernible the germs of a change in the opposite direction. While the iron and steel markets are still headed toward easier levels, there has been a decided turn in some of the non-ferrous metal markets, especially so in copper, where liquidation appears to have been completed. The greatest obstacle in the way of a more rapid alignment of the pig iron market to its correlated commodities is the snail pace at which coke prices are being demobilized. The coke operators are now playing a game of hide and seek with the blast furnace men. They are striving hard to stand pat on present prices until prices for pig iron shall have declined further. Meanwhile, however, one blast furnace after another is being blown out because of the coke operators' attitude, and the probabilities are that before long the present deadlock will be ended by the capitulation of the coke interests. In the meantime the pig iron market is so uncertain that automotive foundries refrain from placing any fresh business. Prices for finished steel products (with the exception to some extent of pipe and sheets) have reached the Steel corporation's levels, but very little business for such commodities, as finished automobile sheets is coming out at these prices for the simple reason that the majority of the automotive purchasing agents are of the opinion that before long the independents will have to shade the corporation's prices. Producers of finished steel have been given to understand that, while most of the automotive plants are in a position to defer the placing of orders until things have become more settled, price inducements would go far toward hastening the placing of such orders. Some of the smaller sheet makers are doing tall thinking on this score. While some markets, like that for pig iron, must, unless all indications deceive, adjust themselves on a still lower basis, astute purchasing agents are on the alert to detect, without too much loss in time, the psychological moment when this or that commodity will have run its full course downward and has given signs of swinging the other way.

**Pig Iron**—With No. 2 foundry quoted at around \$36, valley, consumers maintain a waiting attitude and cover their slight immediate wants out of the plentiful resale offerings. In the Industrial Board schedule, to which steel levels have now receded, foundry pig was set down at \$26.75, valley. This was based on \$4 coke. When coke prices recede to a sensible level consumers look for a \$30, valley, foundry market.

**Steel**—It may be said now that the independents are generally on the Corporation's price basis. One of the latter subsidiaries promptly met the cut of the independents in cold finished steel bars, which are now on a 3.60c., Pittsburgh, basis, a reduction of \$8 a ton. The 8c. quotation for cold rolled strip steel and the 5c. price for the hot variety, which some makers of these specialties are seeking to maintain, are strictly nominal, as resale material is offered at big concessions from these levels.

**Aluminum**—While the contract price of the sole American producer remains unaltered, it is understood that in sales for prompt shipment that factor is meeting the quotations in the outside market, where 98 to 99 per cent virgin ingots are offered at 25c.

**Lead**—The American Smelting & Refining Company's price has been lowered \$10 a ton to 5c., New York and East St. Louis. This is being shaded \$10 a ton by resellers and independents.

**Bank Credits**

*Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Dec. 9—Hopes for a continuation of the easy money of the previous week, which were based on the passing of the peak of the agricultural demands and the liquidation in the stock market, were not realized last week. A temporary check, at least, has occurred in the liquidation of both commodities and securities; and while the money market, it appears, has taken this into account, it has, apparently, also anticipated the demands of the Dec. 15 instalments on Federal income and excess profits taxes, and the interest payments due on Government war loans.

The money market was characterized by a firmer tone with less abundant offerings. Call money ranged from 6 per cent to 7 per cent, with a ruling rate of 7 per cent, as compared with 5 per cent to 7 per cent and a ruling rate of 6 per cent the previous week.

The time money market was dull, with quotations that were practically nominal. Loans on mixed collateral were quoted at  $7\frac{1}{4}$  per cent for sixty and ninety days, and  $6\frac{1}{2}$  per cent for four, five and six months' paper. Rates were approximately  $\frac{1}{4}$  per cent higher for loans secured by all-industrial collateral.

Loans of the New York associated banks continue to decline. The week-end statement for these institutions showed a \$25,140,000 decline in loans, and a \$53,328,000 decline in total net deposits. Excess reserves over legal requirements were \$21,981,040, as compared with a deficit of \$4,085,500 the week before. Government deposits at \$8,289,000 made a low record for the whole war period.

Federal Reserve banks show a slightly less favorable technical position. The week-end statement of the New York Federal Reserve Bank showed a decline in cash reserves of \$33,697,858, and increases in total bills on hand of \$74,242,589, total earning assets \$65,193,235, and net deposits \$32,840,192.

Cash reserves of the Federal Reserve banks as a whole increased \$2,515,000 in spite of a \$1,241,000 decline in gold reserves. Federal Reserve notes in circulation declined \$13,590,000, and bills discounted secured by Government war obligations declined \$31,515,000. On the other hand, total bills on hand increased \$36,723,000, net deposits \$43,617,000, and total earning assets \$30,045,000. The ratio of gold reserves to Federal Reserve notes in circulation, after setting aside 35 per cent against net deposits, declined accordingly from 48.9 to 48.8 per cent.

**INVESTIGATE TIRE PRICES**

WASHINGTON, Dec. 8—Investigation by the Department of Justice of allegations that the large tire companies of the country have been involved in an unlawful agreement to control prices, is well under way and specific action in connection with it may be expected in the

near future. The utmost reticence is being maintained as to just what action is contemplated but there is reason to believe the proceedings will take their usual course. The companies into whose operations the Government has been inquiring, include Goodyear, Goodrich, Firestone, Fisk and Ajax, and others of the larger companies.

**Peru Changes Tariffs  
on Automotive Products**

NEW YORK, Dec. 4—Details of the tariff changes on automobiles, trucks and tractors which went into effect in Peru on Oct. 15 are given in a new bulletin of the Bureau of Foreign and Domestic Commerce. The new rates are based on weight charges, which should be kept in mind by exporters making shipments to that country.

Power farming machines weighing less than 100 kilos, formerly admitted free, are now taxed at the rate of .10 sol per kilo. Spare parts for agricultural machines take the same rate, which doubles the previous duty, and agricultural machinery not otherwise specified—an item which apparently would cover tractors—will bear a duty of .03 sol per kilo.

Motor trucks, formerly free, will be taxed .20 sol per kilo. The former ad valorem rate on passenger cars has been changed to a weight ruling, under which the rate becomes .60 sol per kilo. The old rate ranged from 10 to 20 per cent. Motorcycles, formerly taxed at 30 per cent ad valorem, now take the same rate as automobiles. For computing these rates, the normal value of the sol is \$0.486.

**MANIFOLD PLANT IN BUFFALO**

BUFFALO, Dec. 4—The latest among the industries coming to Buffalo is the Tube Manifold Corp., formed in New York with \$100,000 capital. It has just taken over the Curtiss company plant. It is planned to begin operations in January with 50 employees. The company's product will be manifolds of copper, steel, brass and aluminum for automobiles, tractors, motor boats and airplanes. Louis W. Summer is president of the new company. Other officers are Albert F. Riedle, vice-president, and Charles D. Mathews, secretary and treasurer. All three of the officers have been connected with the Standard Metalware Co. of Thompsonville, Conn., which manufactures the same products.

**ROCKHILL ON GOODYEAR BOARD**

AKRON, O., Dec. 6—L. C. Rockhill, sales manager of the Goodyear Tire & Rubber Co., was elected to the board of directors to-day to succeed J. P. Loomis who is retiring on account of ill health. The meeting was adjourned to Dec. 23 at which time the annual statement and a statement regarding refinancing plans will be given out. A vote of confidence in the present board of directors was passed by stockholders.

**INDUSTRIAL NOTES**

B. & W. Rubber Co., Akron, recently organized and capitalized at \$500,000, will begin manufacturing rubber products shortly after the first of the year in a factory building now nearing completion in the eastern section of the city. The directors have elected the following officers, all Akronites: H. A. Backdorf, president; D. B. Campbell, vice-president; Eric Richards, treasurer, and Mary E. McGowan, secretary and assistant treasurer.

F. C. Sanford Mfg. Co., Bridgeport, announce that they are no longer represented in New York by Russell, Holbrook & Henderson, Inc., and request that all correspondence be addressed to the factory.

Bock Bearing Co., Toledo, has closed down until Jan. 1 because of unstable business conditions. Members of the selling force have been retained and are busy on the road.

United Automotive Body Co. has leased a warehouse in Lansing, where it will contract for work with many of the large car and truck companies. Executive offices of the company are at Springboro, Pa.

International Harvester Co. has purchased a site for a manufacturing and distributing plant in New Orleans, including dock frontage, which will be used for the manufacture of twine.

General Motors Acceptance Corp. has moved its Detroit office to the Durant Building, into which a number of other General Motors units have also moved.

**WIZARD FACTORY COMPLETED**

CHARLOTTE, N. C., Dec. 7—One building of the plant which will be occupied by the Wizard Automobile Co. near this city already has been completed and other structures are contemplated. The product of the concern is designed largely for export through a contract placed by the Manufacturers & Exporters' Alliance of New York. The company was incorporated early this year with a capitalization of \$1,000,000 divided equally between common and preferred stock. It takes its name from Wizard, N. C., a small town four miles west of this city where the plant is located.

The first product of the company will be the Wizard Junior, a 2-passenger roadster weighing 800 lb. with a 2-cylinder, 4-cycle, air-cooled, 15 hp. motor to sell for \$395. A detachable delivery body will be provided.

**CANADA SEEKS TRACTOR TAX**

WINDSOR, ONT., Dec. 6—A movement has been undertaken for the reimposition of the former tariff on farm tractors manufactured in the United States. It is designed to protect Canadian manufacturers. It is asserted by persons formerly interested in the tractor field in the Dominion that the industry was ruined when a Federal order in Council was issued in 1918 providing for free entry of all tractors valued at less than \$1,400. This is believed to be the beginning of a widespread movement to raise tariff restrictions for the protection of Canadian enterprise.

## FINANCIAL NOTES

Continental Motors Corp. has cut its common dividend from 2 per cent quarterly to 1 per cent. The financial statement of the company as now being compared will show the best business the company has enjoyed both as to net profits and volume. This has been accomplished after setting up ample reserves for depreciation, taxes and contingencies.

Malbohm Motors Co. will pay a 4 per cent dividend in stock on Dec. 15. Fractions of shares will not be issued, but each stockholder whose dividend would result in a fraction of a share will receive a warrant entitling him to a full share upon payment of the difference between the fractional amount and the par value.

Lee Rubber & Tire Corp., in a balance sheet as of Sept. 30, shows total assets of \$6,642,211, a gain of \$1,045,942 over the former year. Surplus for the year is shown as \$1,039,470. The net assets applicable to the capital stock are \$5,203,061, or \$34.69 a share of no par value.

Whitney Bearing Corp., Chicago, has been incorporated with a capitalization of \$500,000 to manufacture and deal in bearings, axles, gear cases, etc. The incorporators are Julius and Harry Keller and Francis K. Busch.

Pennsylvania Rubber Co. will pay its regular quarterly dividend of 1½ per cent on its preferred stock and 1½ per cent on common stock on Dec. 15.

Ward-La France Truck Corp., a subsidiary of the American La France Fire Engine Co., Inc., has increased its capital to \$10,300,000.

Packard Motor Car Co. has declared a regular quarterly dividend of 1½ per cent payable on its preferred capital stock Dec. 15.

## WOULD CONTINUE COTTA

ROCKFORD, ILL., Dec. 6—Stockholders of the Cotta Transmission Co., with factory ordinarily employing 150 men in this city, are hopeful of saving the company and have asked creditors to join with them in keeping it a going concern. Liquidation of claims is the chief hope of officials and many have agreed to this plan, realizing that attempt to force payment at this time will wreck the company.

Most of the investors are local people but only a few are manufacturers, who bought stock as an investment and are not sufficiently interested in manufacturing to take the initiative. The company was organized with \$40,000 capital stock but this was later increased to \$100,000 common stock and \$300,000 preferred.

## TO REORGANIZE OHIO TIRE

PORT CLINTON, O., Dec. 7—Reorganization of the Ohio State Rubber Tire Co. is expected to follow the resignation of W. O. Bruess as president, his daughter, Miss Stella Bruess as treasurer and H. S. Ballard of Columbus as secretary. Their action followed complaints of stockholders against the management. The retiring officers have surrendered all the stock they hold in the company against which judgments amounting to more than \$20,000 have

been taken. It is expected that a new board of directors will be elected and that they will be able to reopen the plant which has been closed for some time. The assets of the company are said to be approximately \$700,000 while the liabilities are only about \$150,000.

Fisher Body Assets  
Drop in Six Months

DETROIT, Dec. 6—The balance sheet of the Fisher Body Co. on Oct. 31 compared as follows with that of April 30:

Assets—	Oct. 31, '20	Apr. 30, '20
Ld., bldgs., etc.....	\$21,706,284	\$17,991,201
Gdw., pat., etc.....	2,373,080	1,473,819
Inv. & adv. to affil. cos. ....	678,901	1,993,914
Chevrolet Mot. notes.	4,000,000	4,000,000
Skg. fd. ....	62,065	47,712
Chevrolet Mot. notes.	4,840,000	13,840,000
Current Assets—		
Dfd. Chgs.....	743,110	820,353
Prpd. txs., etc.....	817,848	396,871
Inventories .....	22,104,217	18,119,615
Accts. & notes rec..	8,894,941	5,069,988
Investments .....	1,579,099	1,570,600
Cash .....	2,981,404	7,004,731
	\$70,780,949	\$72,328,804
Liabilities—		
Prof. stock.....	\$3,642,500	\$4,213,500
Com. stock.....	29,711,325	29,711,325
Pfd. stk. of N. Plate		
Gl. Co.....	900,000	900,000
Deb., etc.....	9,924,000	9,829,000
Current Liabilities—		
Notes pay.....	1,520,000	13,560,000
Bank loans.....	7,790,000	5,130,370
Accts. pay.....	4,492,855	1,867,986
Prov. for txs.....	2,908,355	721,484
Reserves .....	1,508,059	6,395,139
Surplus .....	8,483,855	
	\$70,780,949	\$72,328,804

On Oct. 31, 1920, the net tangible assets applicable to the common stock amounted to \$35,822,100 or \$72 per share of no par value.

Dunkirk Axle Succeeds  
Empire Axle Company

DUNKIRK, N. Y., Dec. 7—The Dunkirk Axle Corp. has been formed to succeed the Empire Axle Co. which filed a petition in bankruptcy a few months ago. It has taken over the assets of the Empire company and will continue the manufacture of axles. The officers of the company are: President, A. A. Kessler; vice-president, and general manager, James A. Young; Secretary-treasurer, William H. Poad. The property of the axle company was bought at receivers' sale by Young.

The interests now in control of the Dunkirk Axle Corp. are the same as those which control the Watson Products Corp. of Canastota. They owned the controlling interest in the Empire Axle Co. and were instrumental in the formation of the new corporation.

## RECEIVERS MADE PERMANENT

NEWARK, N. J., Dec. 6—Receiverships in the cases of the Stanwood Rubber Co. of Elizabeth and the Hardman Rubber Co. of New Brunswick have been made permanent by Vice-Chancellor Backes. The bond of Edward A. Hayes, receiver for the Hardman company, has been fixed at \$20,000; that of John Kirkpatrick, receiver for Stanwood, at \$50,000. The plan to combine the two companies still is under consideration.

## MEN OF THE INDUSTRY

Joseph C. Weston has been elected president and general manager of the Ajax Rubber Co., Inc., by the directors of the company. Weston came with Ajax as vice-president a year and a half ago from the United States Rubber Co., with which organization and its subsidiaries he had been connected as an executive for twenty years. He has been a leading figure in the tire industry for many years.

W. V. Logan, formerly manager of pneumatic truck tire sales of the United States Tire Co., has been named manager of distributor sales, with full charge of the sale of distributor brands. C. K. Whidden, formerly manager of solid tire sales, has been made manager of truck tire sales.

George W. Hewitt, secretary-treasurer of the Duplex Truck Co., resigned from that organization and is succeeded by Andrew Langenbacher. Hewitt had been with the organization for four years and previous to that with R. M. Owen Co., Lansing distributors of Reo cars and trucks.

M. M. Fernandez, special representative of the export department of the Nordyke & Marmon Co., will leave on an extended business trip to Mexico, the West Indies and South America. Fernandez was formerly with the John N. Willys Export Corp. of New York.

James C. Armstrong, formerly designing engineer with Fairbanks, Morse & Co., Beloit, Wis., is organizing a company in that city to manufacture a fuel-saving manifold for Ford and other cars. It is to be known as the James C. Armstrong Co. and will be incorporated under Delaware laws.

J. C. Kopf, formerly manager of the engineering department of the Duff Mfg. Co., has been appointed research engineer and placed in charge of a newly established research department. F. W. Schwerin has been promoted to manager of engineering.

J. W. Kerr, for the past seven years South American representative of the Firestone Tire & Rubber Co. has become associated as a partner in the firm of Watson & Co., Buenos Aires and Rosario, Argentina, Ford representatives.

T. B. O'Neill, for thirteen years purchasing agent for the Martin-Evans Co., Brooklyn, has been promoted to sales manager for the company and has been succeeded in his former position by A. Celler.

J. H. Shoemaker, formerly general service manager for the Ericsson Mfg. Co., Buffalo, has resigned to assume the position of sales and service manager of the Southern Electric Service Co., Memphis, Tenn.

Charles Melhado, who has been in charge of export sales for the Bethlehem Motors Corp., has been appointed domestic sales manager; also succeeding in this department Roy S. Davey, who resigned.

Samuel C. Harvey, formerly sales manager of the Indiana Motor Truck Co., has been appointed general sales manager of the H. J. Koehler Motors Corp., Bloomfield, N. J.

Clayton R. Burt has been appointed general manager of the Willys-Overland Co., Ltd. He was formerly assistant general manager of the Russell Motor Car Co., Ltd.

Robert T. Walsh has accepted the position of advertising manager and assistant sales manager of the Apex Motor Corp., Ypsilanti, Mich., manufacturers of the ACE car.

# Calendar

## SHOWS

- Dec. 10-18—New York. Motor Boat Show. Grand Central Palace.
- Dec. 11-20—Los Angeles. Annual Automobile Show. Los Angeles Motor Car Dealers' Ass'n.
- Dec. 18-24—New Orleans. Annual Automobile Show. New Orleans Automobile Dealers Ass'n, Abbott Bldg.
- Jan. 3-8—New York. Motor Truck Show. Motor Truck Ass'n of America, Twelfth Regiment Armory.
- Jan. 8-15—New York. National Passenger Car Show. Grand Central Palace. Auspices of N.A.C.C.
- Jan. 10-17—Portland, Ore., Annual Automobile Show. Automobile Dealers' Ass'n. Municipal Auditorium, M. O. Wilkins, Mgr.
- Jan. 15-29—Philadelphia. Annual Automobile Show. Philadelphia Automobile Trade Ass'n.
- Jan. 17-23—Milwaukee. Annual Automobile Show. Milwaukee Automotive Dealers' Ass'n.
- Jan. 22-27—San Francisco. Second Annual Pacific Coast Automotive Equipment Exposition. Auditorium.
- Jan. 22-29—Baltimore. Annual Automobile Show. Baltimore, Automobile Dealers' Ass'n, 5th Regiment Armory, J. C. O'Brien, Mgr.

- Jan. 22-29—Cleveland. Annual Passenger Car Show. Cleveland Mfr's & Dealers' Ass'n, Wigmor Coliseum.
- Jan. 22-29—Montreal. Annual Automobile Show. Montreal Automobile Trade Ass'n, Motordrome Bldg.
- Jan. 29-Feb. 4—Chicago. National Passenger Car Show. Coliseum, Auspices of N.A.C.C.
- Feb. 5-12—Minneapolis. Annual Automobile Show. Minneapolis Automobile Trade Ass'n.
- Feb. 6-12—Columbus. National Tractor Show. Columbus Tractor & Implement Club, Ohio State Fair Grounds.
- Feb. 12-19—Hartford, Conn., Annual Automobile Show. Hartford Automobile Dealers Ass'n. Armory, Arthur Fifoot, Mgr.
- Feb. 12-19—Kansas City. Annual Automobile Show. Kansas City Motor Car Dealers' Ass'n.
- Feb. 14-19—St. Louis. Annual Automobile Show. St. Louis Automobile Mfr's & Dealers' Ass'n, Robt. E. Lee, Mgr.
- Feb. 14-19—Winnipeg. Western Canada Automotive Equipment Show.
- Feb. 18-28—San Bernardino, Cal., National Orange Show, Fred M. Renfro, Mgr.
- Feb. 19-26—San Francisco. Fifth Annual Pacific Automobile Show, Exposition Auditor-

ium, George Mahlgreen, Mgr.

- Feb. 21-26—Louisville. Annual Automobile Show. Louisville Automobile Dealers Ass'n, First Regiment Armory, C. L. Alderson, sec'y.
- Mar. 2-10—Des Moines. Annual Automobile Show. Coliseum, C. G. Van Vliet, Mgr.
- Mar. 5-12—Brooklyn. Annual Automobile Show. Brooklyn Motor Vehicle Dealers' Ass'n, 23d Regiment Armory, George C. Lewis, chairman.
- Mar. 7-12—Syracuse, N. Y., Annual Automobile Show. Syracuse Automobile Dealers Ass'n, Armory, Howard H. Smith, Mgr.
- Mar. 7-12—Indianapolis. Annual Automobile Show. Indianapolis Automotive Trade Ass'n, Automobile Bldg., State Fair Grounds, John Orman, Mgr.
- Mar. 12-19—Boston. Annual Automobile Show. Mechanics Bldg. and South Armory.
- Mar. 14-19—Omaha. Annual Automobile Show. Omaha Automobile Trade Ass'n, Inc., Omaha Auditorium, C. G. Powell, Mgr.
- April 4-9—Seattle. Annual Automobile Show. Seattle Motor Car Dealers' Ass'n, Arena Hippodrome.
- April—Chattanooga, Tenn., Spring Automobile Show,

Chattanooga Automotive Trade Ass'n, Sunday Tabernacle, C. A. Noone, sec'y.

## FOREIGN SHOWS

- Jan. 7—Sydney. Australian Motor Show.
- Jan. 22-29—Colombo. Ceylon Motor Show.
- Feb. 7—Delhi, India, Delhi Motor Show.
- Mar. 23-28—Witwatersrand Agricultural Show including machinery and motors sections.

## CONVENTIONS

- Dec. 13—Washington. Convention of American Association of State Highway Officials.
- Dec. 28-30—Chicago. Annual Meeting American Society of Agricultural Engineers.
- Jan. 7—New York. Advertising Managers Council, Motor & Accessory Manufacturers' Ass'n.
- Jan. 11-13—S. A. E. Annual Meeting, New York City.
- Feb. 2-4—Chicago. First Annual Meeting, Automotive Electric Service Assn. Hotel La Salle.
- May 4-7—Cleveland. National Foreign Trade Council.
- Oct. 12-14, 1921—Chicago. Twenty-Eighth Annual Convention National Implement & Vehicle Ass'n.

## Cleveland Opens Fight on Car Theft Schools

CLEVELAND, Dec. 4—Alarmed by the fact that in the last three years automobiles worth \$3,500,000 have been stolen in this city alone, and that in the present year 1,894 cars have been stolen, the Cleveland Automobile Manufacturers' & Dealers' Association have undertaken to break up and smash a ring of thieves, which, it is said, has been uncovered here.

George K. Wadsworth, president of the commercial car dealers association, said a determined effort was being made to make it absolutely safe for a man to own a car in Cleveland. He declared that dealers and manufacturers are going to see the thing through and are going to rout the auto thieves. F. E. Stuyvesant, president of the passenger car dealers organization, made a like statement.

## GERMANY TO ASSEMBLE FORDSON

DETROIT, Dec. 7—Preliminary plans have been made by Henry Ford for the introduction of his tractors into Germany. This will be made possible through an arrangement with the German firm of Ehrich & Graetz, manufacturers of lighting fixtures. Graetz recently returned to Germany after a conference with the Fords. The business will be set in motion by the shipment of a small number of complete tractors to Germany. If no objection is raised to their entry into the country, other shipments will follow. When the business is

established, it is expected that all the parts except the motors will be manufactured in Germany. The Teutonic territory is said to offer a potential market for tractors and the German backers of the enterprise predict that a large trade can be developed.

## Lecturers Pick Topics for Tractor Exhibit

COLUMBUS, Dec. 3—The committee in charge of the coming National Tractor Show, which will be held at Columbus, Feb. 6 to 12 inclusive, has arranged in part a program of lectures on tractors and power machinery. Some of the principal speakers will be J. B. Davidson of Iowa State College, who will speak on "The Modern Trend of Tractor Designs"; Prof. G. W. McCuen of Ohio State University, "Some Lessons from a Tractor Survey of Ohio"; Prof. William Aikenhead of Purdue University, "Tractor and Belt Power," and Prof. R. U. Blasingame of Pennsylvania State College, "Should a Tractor or Tractor Tools Be Purchased by Community Groups?"

In addition mass meetings will be held at 4 P. M. on certain evenings when more popular subjects will be treated by men of national prominence. Among the number will be Secretary of Agriculture Meredith. Contracts for space in the show are coming in and there is not a cancellation, despite the unsettled business conditions. About three-fourths of the available space has been sold.

## Manitoba to Boost Business with Show

WASHINGTON, Dec. 4—A review of the automobile industry in the province of Manitoba prepared for the Department of Commerce here by the American vice-consul at Winnipeg shows that every effort is being made to push sales. The Western Canada Automobile Show will be held in the Board of Trade Building Feb. 14-19 and about eighty dealers are expected to exhibit cars and accessories.

The show will be financed by the sale of space. Winnipeg is the western distributing center for American cars and the initial show is expected to boom business throughout the province. W. L. Williams, chairman of the executive committee, has announced that all applications for space must be filed by Dec. 15.

Dealers in Winnipeg anticipate heavy truck sales as a result of the example set by the municipal authorities in asking for an appropriation to purchase ten new trailers. The equipment will cost about \$30,000 and effect a saving of 20 to 30 per cent in the operation of the department. British truck manufacturers have opened two agencies in Winnipeg and are advertising their goods extensively.

The provincial license department states that 35,117 automobile licenses and 1059 motorcycle tags were issued this year with a revenue of \$396,505. Anti-theft legislation is being prepared.